6-2010

The Land Conservation Plan for Maine's Piscataqua Region Watersheds

Steve Walker
Maine Beginning with Habitat

Tin Smith
Wells National Estuarine Research Reserve

Paul Schumacher
Southern Maine Regional Planning Commission

Jason Czapiga
Maine Beginning with Habitat

Derek Sowers
Piscataqua Region Estuaries Partnership

See next page for additional authors

Authors
Steve Walker, Tin Smith, Paul Schumacher, Jason Czapiga, Derek Sowers, jamie Oman-Saltmarsh, and Paul Dest

THE LAND CONSERVATION PLAN FOR MAINE'S PISCATAQUA REGION WATERSHEDS

Beginning with HABITAT

The Nature Conservancy
Protecting nature. Preserving life.

Mt. Agamenticus to the Sea Conservation Initiative

wellsreserve

Piscataqua Region Estuaries Partnership

SOUTHERN MAINE REGIONAL PLANNING COMMISSION

THE LAND CONSERVATION PLAN FOR MAINE'S PISCATAQUA REGION WATERSHEDS

JUNE 2010

Developed through a partnership of the following organizations:
Piscataqua Region Estuaries Partnership
Maine Beginning with Habitat
Wells National Estuarine Research Reserve
Southern Maine Regional Planning Commission
Mt. Agamenticus to the Sea Conservation Initiative
The Nature Conservancy

SUGGESTED CITATION

Walker, S., T. Smith, P. Schumacher, J. Czapiga, D. Sowers, J. Oman-Saltmarsh, and P. Dest. 2010. *The Land Conservation Plan for Maine's Piscataqua Region Watersheds.* Maine Beginning with Habitat, Wells National Estuarine Research Reserve, Southern Maine Regional Planning Commission, and Piscataqua Region Estuaries Partnership. Published by the Piscataqua Region Estuaries Partnership, Durham, NH.

REPORT AUTHORS

Maine Beginning with Habitat: Steve Walker, Jason Czapiga
Wells National Estuarine Research Reserve: Tin Smith, Paul Dest
Southern Maine Regional Planning Commission: Paul Schumacher, Jamie Oman-Saltmarsh
Piscataqua Region Estuaries Partnership: Derek Sowers

Publication design and production: Tricia Miller, MillerWorks

PHOTOGRAPHY

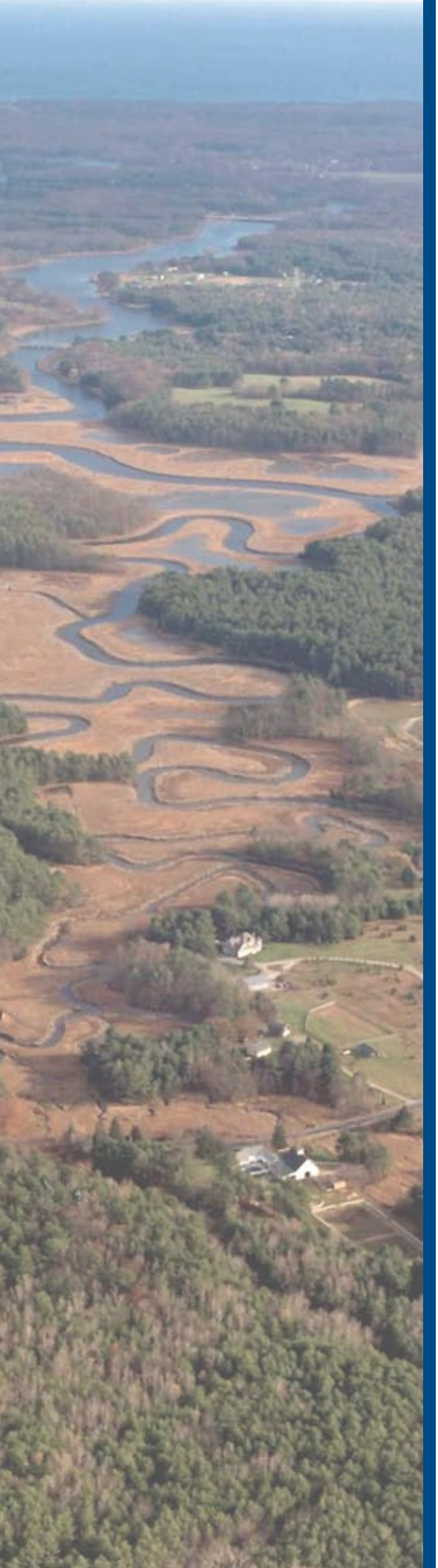
Unless otherwise noted, all photos are from the Piscataqua Region watershed and were taken by staff from the Wells National Estuarine Research Reserve and the Piscataqua Region Estuaries Partnership.

PROJECT SUPPORT

Funding for this project was provided by the participating organizations and the following sponsors:
the New Hampshire Charitable Foundation – Piscataqua Region
through a gift award to the Piscataqua Region Estuaries Partnership, and
the Maine Coastal Program through a grant to the Wells Reserve.

NEW HAMPSHIRE CHARITABLE FOUNDATION

Maine Coastal Program



THE LAND CONSERVATION PLAN FOR MAINE'S PISCATAQUA REGION WATERSHEDS

JUNE 2010

Beginning with HABITAT

The Nature Conservancy
Protecting nature. Preserving life.

Mt. Agamenticus to the Sea Conservation Initiative

wells reserve

Piscataqua Region Estuaries Partnership

ACKNOWLEDGEMENTS

The development of this plan was a truly collaborative effort among representatives from numerous agencies and organizations with a shared vision of developing a scientifically-based blueprint for the protection of wildlife habitat and water quality within the Piscataqua Region of southern Maine. The Steering Committee for the project was led by the following organizations and individuals:

- Piscataqua Region Estuaries Partnership: Jennifer Hunter, Derek Sowers
- Beginning with Habitat, Maine Department of Inland Fisheries & Wildlife: Steve Walker, Jason Czapiga
- Wells National Estuarine Research Reserve: Paul Dest, Tin Smith, Chris Feurt, Zack Steele
- Mt. Agamenticus to the Sea Conservation Initiative: Jodi Castallo
- The Nature Conservancy: Joshua Royte, Mark Zankel
- The Southern Maine Regional Planning Commission: Paul Schumacher, Jamie Oman-Saltmarsh

In addition to leadership from the Steering Committee, the development of this plan was greatly aided with the input and advice of the following natural resource experts who are actively working on conservation issues pertinent to the southern Maine region: Phillip deMaynadier, Judy Camuso, Judy Gates, Barbara Vickery, Elizabeth Hertz, Sally Stockwell, Barbara Charry, Robert Houston, Don Cameron, and Doreen McGillis. Jason Czapiga of Maine Beginning with Habitat is gratefully acknowledged for providing the GIS and cartographic expertise and products for the project.

The Steering Committee members express their gratitude to the many citizens, municipalities, and land trusts that are actively engaged in permanent land protection within Maine's Piscataqua Region – their commitment to conservation is the key to building the network of protected natural areas that will sustain future generations of wildlife and human populations alike.

Funding for this project was provided by the participating organizations, the New Hampshire Charitable Foundation – Piscataqua Region through a gift award to the Piscataqua Region Estuaries Partnership, and the Maine Coastal Program through a grant to the Wells Reserve.

CONTENTS

EXECUTIVE SUMMARY

The Piscataqua River/Great Bay estuary is a shared coastal embayment that forms the southernmost boundary between the states of Maine and New Hampshire. This rich coastal bay provides critical ecological, economic, and social benefits to the southern Maine and coastal New Hampshire region. The Great Bay estuary is such an important coastal resource that it is officially recognized as a coastal area of national significance by both the federal National Estuary Program and the federal National Estuarine Research Reserve program. The Piscataqua River/Great Bay estuary is fed by many rivers in New Hampshire, and by the Salmon Falls River, Great Works River, and Spruce Creek watersheds in Maine. Collectively, the land area that contributes water flow to this treasured bi-state estuarine system is referred to as the "Piscataqua Region." Within Maine, this region includes portions or all of ten Maine communities: Acton, Berwick, Eliot, Kittery, Lebanon, North Berwick, Sanford, South Berwick, Wells, and York.

TERRASERVER

Great Bay and the Piscataqua River.

A rigorous science-based land conservation plan for this region is needed for two key reasons: first, the region still contains exceptional unfragmented natural areas of significant size to support many critical wildlife populations and maintain high water quality; and second, these natural areas face very real threats associated with rapid population growth and development. Citizens and communities currently have a window of opportunity to protect the region from the poorly planned development patterns that have befallen other regions of the country, and to establish a long-term network of connected natural areas that will provide abundant wildlife and clean water into the future.

PURPOSES OF THIS PLAN

This Plan is meant to address the *where*, *why*, and *how* questions pertaining to effective land conservation planning work. In other words, *where* are the most critical natural areas to protect, *why* are these areas so important, and *how* can communities effectively protect these areas? The Plan addresses the *where* by clearly mapping the lands deemed most valuable for the protection of wildlife habitat and protection of water quality. The Plan addresses the *why* by providing detailed data on the characteristics of the priority Conservation Focus Areas (size, condition, presence of rare plant/animal species and priority habitat types, *etc*.) that merit their recognition as conservation hot spots. Finally, the Plan addresses the *how* by providing a diverse toolkit of voluntary and regulatory options available to organizations and municipalities interested in protecting these critical natural areas.

The geographic scope of this plan encompasses eighteen southern Maine municipalities. While the initial focus of this effort was on the ten Maine communities with land area within the Salmon Falls/Piscataqua River drainage basin, adjacent communities with shared Conservation Focus Areas were also included in order to more accurately reflect the size and location of these critical natural areas without being truncated by municipal or watershed boundaries. This plan is designed to assist citizens in the 18 Maine towns who are involved in sustaining and improving their communities as they serve on select boards, planning boards, conservation commissions, economic development boards, schools, or non-profit community organizations such as land trusts, watershed coalitions, conservation groups, and recreation clubs. The plan's purpose is to provide a scientific and experienced-based guide for the protection of natural resources vital to thriving communities through a variety of possible actions.

The Piscataqua Region Watershed.

IDENTIFYING LAND CONSERVATION PRIORITIES

The identification of land conservation priorities was driven primarily by the two top priority conservation goals of the plan: protection of *living resources and water quality.* The Maine Department of Inland Fisheries & Wildlife Beginning with Habitat (BwH) Program produces and maintains data and detailed maps of species distribution, wildlife habitat, and water resources. This rich existing data source allowed the project team to best highlight those lands and waters known to be important for conserving living resources – native plants, animals, and natural communities – and offered a starting point for assessing the relative "intactness" of forests and riparian buffers necessary to protect water quality. In light of today's challenges of increased landscape fragmentation and future challenges associated with climate-induced species range shifts, landscape-scale conservation (protecting large areas that offer the greatest chance to support viable habitat under increased pressure) is likely the best approach to planning for a resilient and functional landscape for future generations. The process used to identify top priority land conservation areas was guided by widely accepted and applied principles of conservation biology and water resource protection.

A Ringed Boghaunter.

To identify areas of high significant resource co-occurrence, the project team used the following approach:

- Employ a science-based approach utilizing existing BwH natural resource data.
- Develop criteria based on expert opinion to highlight the most significant natural resource features from a regional perspective.
- Incorporate documented natural resource features and predictive GIS modeling into a co-occurrence model that could be applied consistently throughout the watershed.
- Analyze data at the spatial scale of multiple towns and watersheds.
- Synthesize information to identify focal areas for conservation attention.
- Solicit review by local experts and resource agency staff.
- Cross reference results with existing conservation plans at local, state, and federal levels.

The project team identified six categories of key natural resource features from existing BwH data that best address the conservation plan priorities of living resources and water quality:

1. Unfragmented habitat
2. Riparian zones on freshwater and tidal rivers, streams, lakes, and ponds
3. Significant Wildlife Habitats as mapped by MDIF&W
4. Rare, threatened, and endangered plant and animal occurrences
5. Habitat for USFWS Priority Trust Species
6. Rare and exemplary natural communities

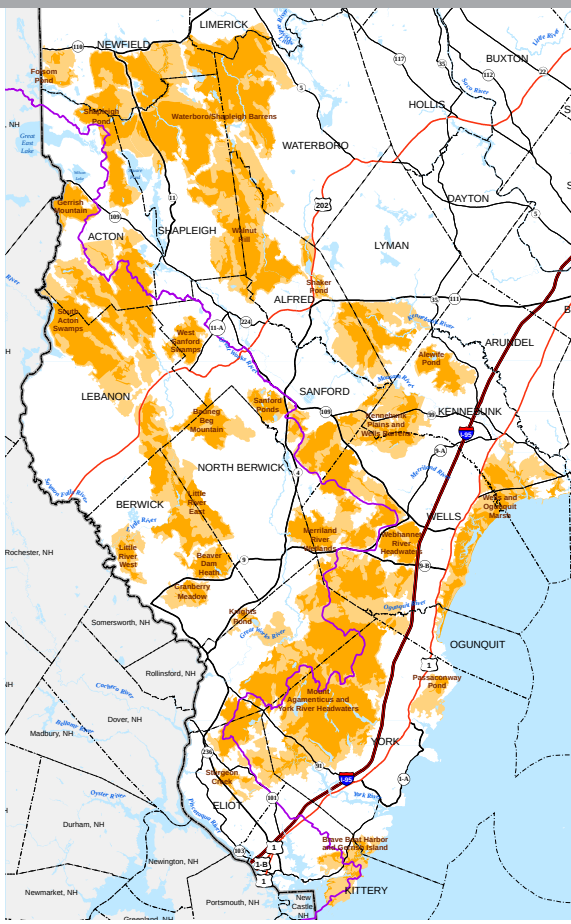
A Geographic Information System (GIS) natural resource co-occurrence model was used to aid in identifying areas where several resource values coincide and overlap, thus signaling locations with multiple conservation values and potentially higher priority for protection. In order to fully evaluate the six natural resource categories listed above, thirty existing data sets were provided to an expert panel of natural resource professionals and community planners to establish the relative importance of each layer and to provide a layer-specific score for GIS model weighting purposes.

Using the GIS-based systematic analysis of a wealth of natural resources data, the project team identified 25 distinct Conservation Focus Areas (CFAs) that represent the land areas with the highest known values for wildlife habitat and water quality. In designating CFAs the steering committee paid particular attention to remaining unfragmented landscapes best capable of supporting future ecological functions, and where local conservation efforts would address the greatest number of state conservation priorities as outlined in Maine's State Wildlife Action Plan.

CFAs were delineated based on natural and man-made boundaries, and consist of "Core Areas" and "Supporting Natural Landscapes." Core Areas consist of the contiguous

geographic area that contains the primary natural features and habitat for which the Conservation Focus Area was identified. Core Areas contain essential habitat for plant and wildlife species of concern and exemplary natural communities, highest quality small watersheds and other vital freshwater features, irreplaceable coastal resources such as estuarine shoreline, and the best remaining examples of intact forest ecosystems. These unfragmented areas, which are wholly or almost entirely undeveloped, represent the highest priority for conservation and protection. Supporting Natural Landscapes include the surrounding area that helps to safeguard the Core Area while also providing habitat for many common species. Supporting Natural Landscape contains buffer around the Core Area, undeveloped watersheds, and undeveloped forest blocks, helping to maintain ecological processes upon which habitats and species depend. Conserving Supporting Natural Landscapes will embed the Core Areas in a minimally fragmented and minimally disturbed matrix, thus helping to maintain the viability and quality of the Core Area natural features over time.

This plan document identifies 25 Conservation Focus Areas (CFAs) of regional (and in some cases statewide) environmental importance that are located within the eighteen Maine communities covered by this effort. Collectively, these areas comprise approximately 85,642 acres designated as Core Areas and an additional 74,523 acres of Supporting Natural Landscapes. In addition, this plan promotes the importance of protecting undisturbed shorelands along all wetlands, streams, rivers, and lakes in order to maintain clean water.



Map detail: Conservation Focus Areas in the Maine Piscataqua Region (see page 24).

IMPLEMENTATION OF THE PLAN

The implementation strategies described in the Plan present a series of options and tools for municipalities, conservation organizations, and citizens to pursue in order to conserve the resources which are valued by the citizens of the region. Some of the implementation strategies have been extracted from the Beginning with Habitat Guidebook while others come from examples of work already successfully undertaken by towns in the region.

This Plan recommends seven implementation actions. These strategies provide specific guidance for the work of conservation organizations, municipalities, and citizens who will put this plan into action on the landscape. Some of this guidance has been extracted from the Beginning with Habitat Guidebook, and some comes from examples of work already successfully undertaken by other towns in Maine.

RECOMMENDED IMPLEMENTATION ACTIONS

1. Interagency Adoption and Use of the Plan
2. Pursue Permanent Land Protection
3. Incorporate Conservation Plan into Municipal Comprehensive Plans and Planning in General
4. Increase Municipal Capacity for Open Space Planning
5. Provide Outreach/Education to Landowners, Citizens, and Leaders
6. Update Local Regulations
7. Raise Revenues for Local Land Conservation

SECTION 1:
INTRODUCTION

The Piscataqua River/Great Bay estuary is a shared coastal embayment that forms the southernmost boundary between the states of Maine and New Hampshire. This rich coastal bay provides critical ecological, economic, and

social benefits to the southern Maine and coastal New Hampshire region.

The Great Bay estuary is such an important coastal resource that it is officially recognized as a coastal area of national significance by both the federal National Estuary Program and the federal National Estuarine Research Reserve program.

The Piscataqua River/Great Bay estuary is fed by many rivers in New Hampshire, and by the Salmon Falls River, Great Works River, and Spruce Creek watersheds in Maine. Collectively, the land area that contributes water flow to this treasured bi-state estuarine system is referred to as the "Piscataqua Region."

Within Maine, this region includes portions or all of ten Maine communities: Acton, Berwick, Eliot, Kittery, Lebanon, North Berwick, Sanford, South Berwick, Wells, and York.

The Piscataqua Region Watershed.

WHY DEVELOP A LAND CONSERVATION PLAN FOR MAINE'S PISCATAQUA REGION WATERSHEDS?

A rigorous science-based land conservation plan for this region is needed for two key reasons:

1. The region still contains exceptional unfragmented natural areas of significant size to support many critical wildlife populations and maintain high water quality; and
2. these natural areas face very real threats associated with rapid population growth and development.

BARB MCMILLAN

The Piscataqua River at Portsmouth, New Hampshire.

The Piscataqua Region and surrounding landscape is an area rich in high-quality wildlife habitat and natural areas. The rivers and estuary of the Piscataqua Region provide critical amenities to local residents, including: drinking water, food (fish, shellfish, aquaculture), recreation (boating, swimming), and aesthetics (views, property values). The water flows into the Gulf of Maine, formerly one of the most productive fishery regions in the world. However, the exceptional natural resources of the region, as well as the mostly rural character valued by many current residents, are under pressure from increasing population growth and development. Between 1960 and 1990, the population of York County Maine increased by 88% (US Census Bureau, 2000).

While there is some heavy industry along its banks, the Piscataqua River is also being threatened by accumulating increments of smaller land use changes. Forests and fields are being steadily converted to hardened (impervious) surfaces, such as roofs, lawns, parking lots, and roads. Not only is the region's population growing, but the amount of impervious surface per person is also rising. In addition, homes and businesses are using increasing amounts and varieties of water soluble chemicals including cleansers, pesticides, prescription drugs, fertilizers, and petroleum products – all of which are finding their way into the region's surface waters. Regional climatic trends clearly show a pattern of increasing frequency and intensity of extreme storm events, bringing land pollutants more quickly into water bodies with less chance to be purified by plants and soil.

Every three years, the *State of the Estuaries Report* by the Piscataqua Region Estuaries Partnership (PREP) documents environmental trends in the Piscataqua (Great Bay) and Hampton-Seabrook estuaries (bays). The 2009 report documented that 11 of the 12 tracked environmental indicators are showing either a cautionary or negative trend. This is up from seven indicators classified this way in 2006. ***In response to these poor environmental trends, it is clear that immediate action is needed to both reduce pollution loading to the region's waterways as well as to protect natural landscape features that currently serve to maintain high water quality and wildlife habitat.***

Once natural landscapes are fragmented with roads, paved over, or developed into sprawling suburbs their ability to provide high-quality wildlife habitat and clean drinking water is permanently degraded or lost. Fortunately, significant portions of the Piscataqua Region in Southern Maine currently retain large undeveloped areas of critical wildlife habitat and high quality waters. In order to ensure that these exceptional qualities of the region are maintained for the benefit of future human and wildlife populations, it is essential that the communities of the region identify and protect the remaining undeveloped lands with the greatest value for supporting diverse and abundant wildlife populations and maintaining clean water. This conservation plan was created as a science-based tool to support the implementation of this mission. Citizens and communities

currently have a window of opportunity to protect the region from the poorly planned development patterns that have befallen other regions of the country (e.g. Chesapeake Bay), and to establish a long-term network of connected natural areas that will provide abundant wildlife and clean water into the future.

There are many citizens, natural resource agencies, and conservation organizations with a strong commitment to protecting existing high quality conservation land in this region. Some of the towns and organizations in the region have developed local conservation plans and priorities, but there has not been strong consistency in the criteria used to identify areas that are top priorities for land protection. The State of Maine's Beginning with Habitat (BwH) program has developed high quality maps of the distribution of natural habitat types found throughout the state, but the priority areas for conservation identified by these maps tend to be statewide priorities instead of regional or local-level priorities. To fill this gap, a scientifically-based plan was needed that utilized consistent criteria to identify regionally-significant conservation areas and that provided detailed maps of Conservation Focus Areas to towns and land trusts that work at the local town level. This document fills that gap and provides a blueprint for protecting the highest priority remaining large blocks of undeveloped lands in order to preserve water quality and sustain diverse wildlife populations.

PURPOSES OF THIS PLAN

This Plan is meant to address the *where*, *why*, and *how* questions pertaining to effective land conservation planning work. In other words, *where* are the most critical natural areas to protect, *why* are these areas so important, and *how* can communities effectively protect these areas? The Plan addresses the *where* by clearly mapping the lands deemed most valuable for the protection of wildlife habitat and protection of water quality. The Plan addresses the *why* by providing detailed data on the characteristics of the priority Conservation Focus Areas (size, condition, presence of rare plant/animal species and priority habitat types, etc.) that merit their recognition as conservation hot spots. Finally, the Plan addresses the *how* by providing a diverse toolkit of voluntary and regulatory options available to organizations and municipalities interested in protecting these critical natural areas.

This plan is designed to assist citizens in the 18 Maine towns who are involved in sustaining and improving their communities as they serve on select boards, planning boards, conservation commissions, economic development boards, schools, or non-profit community organizations such as land trusts, watershed coalitions, conservation groups, and recreation clubs. The plan's purpose is to provide a scientific and experienced-based guide for the protection of natural resources vital to thriving communities through a variety of possible actions.

The geographic scope of this plan encompasses eighteen southern Maine municipalities. While the initial focus of this effort was on the ten Maine communities with land area within the Salmon Falls/Piscataqua River drainage basin, adjacent communities with shared Conservation Focus Areas were also included in order to more accurately reflect the size and location of these critical natural areas without being truncated by municipal boundaries or watershed divides. If a portion of a town fell within the Piscataqua River watershed boundary, resources within the entire town were included in modeling efforts in hopes that a town-wide consideration of high value resources would better assist local planning efforts. Similarly, lands within three miles of the watershed divide were also included in the GIS modeling efforts to better account for supporting landscapes such as large unfragmented forest blocks and mapped significant wildlife features that extend beyond the limits of the watershed. The plan authors felt that including modeling results that fell outside of the primary focus of this plan (the Piscataqua River watershed) was warranted to assist broader planning efforts within the southern Maine region. Thus, the CFAs identified, described, and mapped in this plan covers 18 Maine municipalities instead of just the 10 Maine communities that contain land within the Piscataqua River watershed.

This Plan identifies 25 Conservation Focus Areas (CFAs) of regional (and in

some cases statewide) environmental importance that are located within the eighteen Maine communities covered by this effort. This Plan is intended to complement and provide additional context for local conservation and open space plans, not supplant them. The CFAs still retain a relatively intact natural landscape, and were identified in a systematic manner by compiling existing scientific data and selecting areas that had the highest values for habitat and clean water. In addition, this Plan promotes the importance of all stream, river, and lake shorelands in maintaining clean water. Whether these shorelands are located in the middle of downtown, on a farm, or on a woodlot, they are essential to keep undeveloped in order to support diverse and abundant wildlife populations and a healthy environment for people. This plan supports the Piscataqua Region Estuaries Partnership's goal of increasing the amount of protected lands from the current 5.7% to 15% within the Maine portion of the Piscataqua Region watershed by 2020.

HOW DOES THIS PLAN COMPLEMENT LAND CONSERVATION EFFORTS IN NEW HAMPSHIRE?

The Piscataqua Region Estuaries Partnership (PREP), formerly called the New Hampshire Estuaries Project, is part of the U.S. Environmental Protection Agency's National Estuary Program, which is a joint local/state/federal program established under the Clean Water Act with the goal of protecting and enhancing nationally significant estuarine resources. PREP receives its funding from the EPA and is administered by the University of New Hampshire. The mission of PREP is to protect, enhance, and monitor the environmental health of the Great Bay and Hampton-Seabrook estuaries and their associated watersheds. In 2008, the program expanded its area of focus beyond New Hampshire to include the watershed area in Maine. More than 20 New Hampshire and Maine organizations are represented on the PREP Management Committee.

In 2000, PREP completed a *Comprehensive Conservation and Management Plan* for the 42 New Hampshire communities within the watersheds draining to the Great Bay and Hampton-Seabrook estuaries. Habitat protection actions within this plan called for providing technical assistance to land trusts and municipalities in support of their efforts to protect the best remaining areas for wildlife habitat and water quality. In 2006, *The Land Conservation Plan for New Hampshire's Coastal Watersheds* was completed. This plan combined the best available data on habitat with state-of-the-art geographic information system (GIS) analysis to identify the best remaining opportunities for permanent land protection within the NH portion of the Piscataqua Region. The effort to develop *a Land Conservation Plan for Maine's Piscataqua Region* was initiated in 2009. This plan is based on a similar approach as the New Hampshire plan, but is tailored to Maine. Together, these

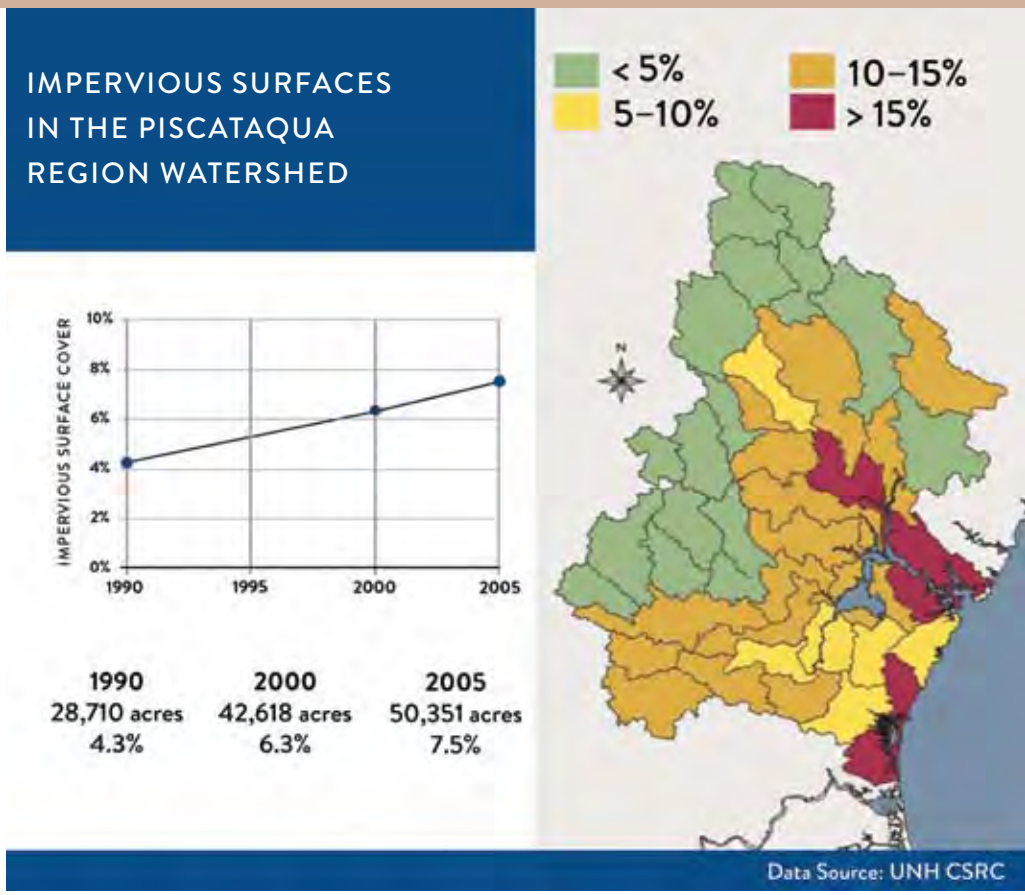
MAINE TOWNS IN PISCATAQUA RIVER WATERSHED

	TOTAL ACRES	ACRES IN PISCATAQUA WATERSHED	% OF TOWN IN WATERSHED
KITTERY	11,062	7,842	71%
ELIOT	12,755	9,628	75%
YORK	35,556	1,755	5%
SOUTH BERWICK	20,704	17,803	86%
WELLS	36,504	6,680	18%
NORTH BERWICK	24,414	24,414	100%
BERWICK	24,220	24,220	100%
SANFORD	31,193	12,190	39%
LEBANON	35,625	35,625	100%
ACTON	26,401	14,638	55%
TOTALS	**258,796**	**156,106**	**60%**

two plans encourage a bi-state regional approach to addressing water quality and habitat issues throughout the region.

The Piscataqua River drainage covers 1086 square miles in both New Hampshire and Maine. The Maine portion of the watershed comprises an area of 244 square miles (156,106 acres) and represents slightly less than a quarter of the whole watershed. The Maine communities located in this region, as with their counterparts in New Hampshire, are experiencing a steady growth in population, as, indicated by a 74% increase in the total population between 1970 and 2010.

Every three years PREP produces the *State of the Estuaries Report* detailing the condition and trend of 12 indicators for New Hampshire's estuaries. The *2009 State of the Estuaries Report* found that 11 of the 12 indicators being tracked were either negative or cautionary over the preceding 3 years. Negative trends (indicator is demonstrating deteriorating conditions) included nitrogen concentrations in the water, amount of eelgrass beds, distribution of oyster beds, and the amount of impervious surfaces. Cautionary trends (indicator demonstrates possibly deteriorating conditions) included bacteria, toxins in shellfish, toxins in sediment, dissolved oxygen levels, clams, anadromous fish, and habitat restoration. This is an increase from 7 indicators classified as negative or cautionary in 2006. These issues and trends cannot be effectively addressed without the participation of all the watershed communities.



HOW WAS THIS CONSERVATION PLAN DEVELOPED?

The Land Conservation Plan for Maine's Piscataqua Region Watersheds was developed by bringing together a team of regional experts (biologists, planners, scientists) from Maine to evaluate the natural resources known to exist in the watershed. Data was used from the Maine Department of Inland Fisheries and Wildlife Beginning with Habitat Program, US Fish and Wildlife's Priority Trust Species, land cover, wetlands and water resources, and existing conservation land. In a series of meetings using Geographic Information System mapping (GIS) different weights were given to the various mapped natural resource features. These features included:

- Undeveloped and unfragmented habitat areas
- Intact riparian buffers
- Rare and significant wildlife, plants, and habitat

By mapping and overlaying the different resource values, geographic areas where multiple natural resources were present and overlapped became readily apparent. These areas formed the basis for delineating 25 Conservation Focus Areas (CFAs). It is these Conservation Focus Areas that if largely protected will provide the most benefit to sustain the health of the Piscataqua estuary and its surrounding communities. (Refer to Section III for a detailed explanation of the data and methods used to identify priority Conservation Focus Areas.)

HOW DOES THIS PLAN DIFFER FROM OTHER, EXISTING CONSERVATION PLANS?

This plan differs from other conservation plans as it focuses on the Maine communities within the Piscataqua watershed with a regional approach that has water quality and wildlife habitat as the priorities. This plan identifies 25 Conservation Focus Areas (CFAs) of regional (and in some cases statewide) environmental importance that are located within the Maine communities covered by this effort. It also provides a guide and support for federal funding applications to the State of Maine Coastal and Estuarine Land Conservation Program Plan (Maine CELCP Plan). This Plan is intended to complement and provide additional context for local conservation and open space plans, not supplant them.

RELATIONSHIP TO THE CELCP PROGRAM

The Coastal and Estuarine Land Conservation Program (CELCP) is an important federal funding program administered by the National Oceanic and Atmospheric Administration. This program was created to help states and coastal communities protect important natural areas within their coastal zone. To be eligible for this funding source, a coastal state must have completed a plan that identifies the criteria and methods by which that state will identify high priority areas for permanent land protection. The Maine CELCP Plan recognizes the Maine coast as a resource of national importance and identifies the need to increase the quality and quantity of permanently protected lands. The purpose of the Program is to protect important coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values with consideration given to the threat of loss, ecological significance, and potential for effective management.

The Maine CELCP Plan covers all coastal shorelines up to the head of tide, which for the Piscataqua watershed is the Route 4 bridge dam on the Salmon Falls River between South Berwick and Rollinsford. The purpose of the plan is to support land conservation projects that can show a direct and positive impact on marine and estuarine resources. These resource acquisition and protection priorities fall into three categories:

Route 4 bridge dam on the Salmon Falls River between South Berwick and Rollinsford.

1. Habitat protection for lands that help maintain healthy populations of plants and animals indigenous to the coast, including lands containing rare and endangered species, as well as, relatively large blocks of undeveloped lands that support naturally functioning populations of plant and wildlife species.
2. Coastal Access for recreational and resource management purposes, including lands that provide "working" access to coastal and marine resources. These types of lands and sites provide significant recreational value.
3. Scenic and cultural features and areas that protect the scenic qualities of the coast, and help preserve special and unique historical resources and cultural features.

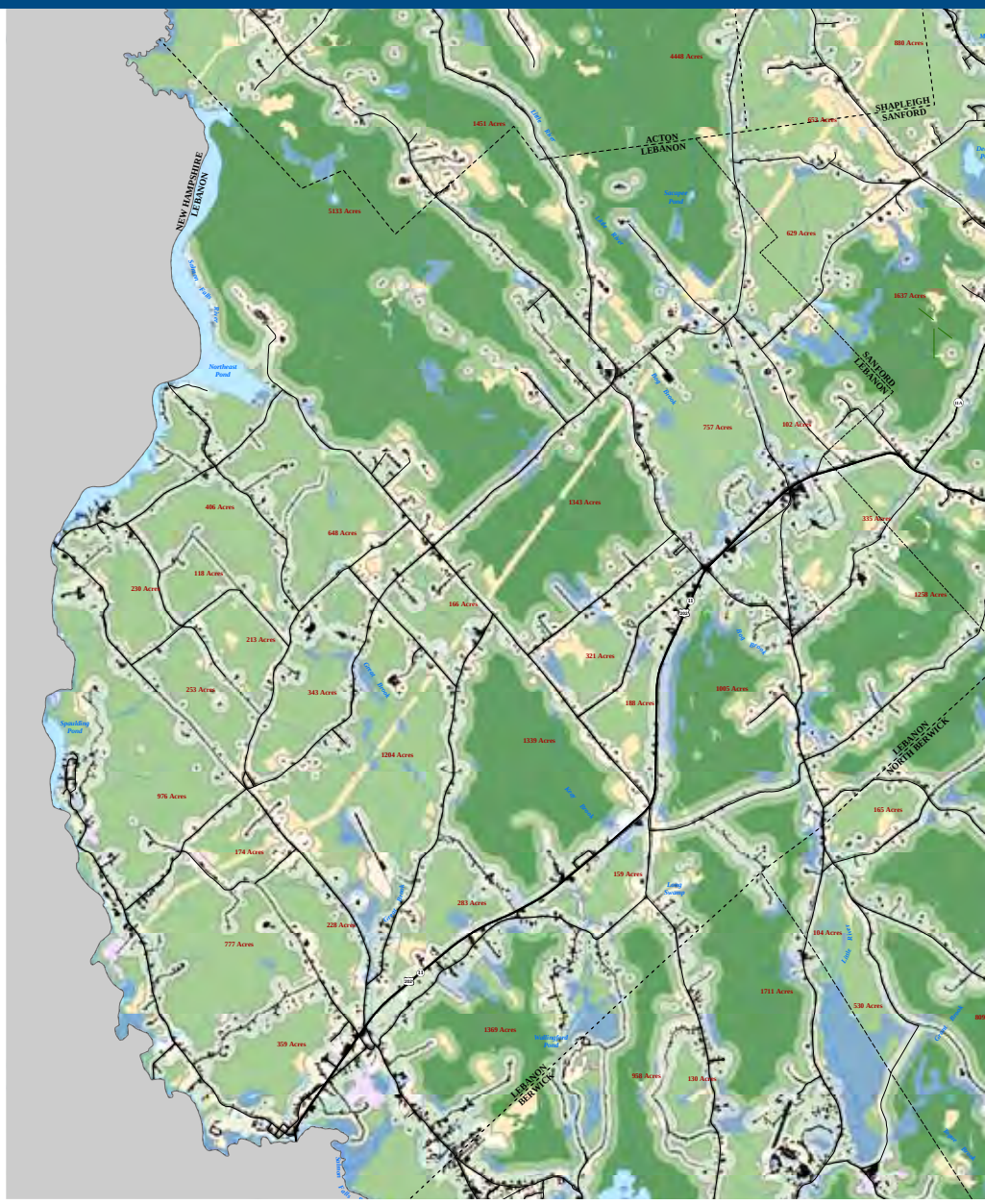
The Land Conservation Plan for Maine's Piscataqua Region Watersheds focuses on accomplishing the first purpose of the Maine CELCP plan with an emphasis on the underlying importance of water quality. This plan recognizes that categories #2 and #3 will most likely be part of actual conservation projects.

SECTION II:
WATERSHED OVERVIEW

Southern Maine and adjacent New Hampshire are within the overlapping edges of two bio-geographical zones. This region is the northern extent of the Atlantic Coastal Plain and southern hardwood forest and the southern extent of the Northern Spruce/Fir forest. This intersection and mixing of the two forest types results in a great diversity of species. In Maine many of the habitats in the Piscataqua and adjacent watersheds are found nowhere else within the state.

The Piscataqua River watershed is unusual in the region as it has large enough flow volumes to support a diversity of freshwater tidal and brackish tidal marsh communities. Other adjacent or nearby watersheds are much smaller in size and do not have enough freshwater flow, particularly in summer, to prevent salt water from intruding throughout their estuaries.

In *An Ecological Assessment of the South Coastal and Southwestern Interior Regions of Maine* (2002) Don Cameron of the Maine Natural Areas Program identified seven "Priority Areas" within the watershed selected for their size, condition, rarity, and confluence of rare plant, animal, and natural community habitats. This assessment directly supports the overlapping of ecological zones found here that contributes to a high degree of plant and animal diversity.



A detail of BwH Map 3 Undeveloped Habitat Blocks for Lebanon. The undeveloped habitat blocks are shown in dark green.

Despite human population growth over the past forty years, significant blocks of undeveloped land that sustain healthy wildlife populations and maintain high water quality still remain. These have been mapped by Maine's Beginning with Habitat Program. There are, either entirely or partially within the 10 Maine towns in the Piscataqua Region, 5 blocks of forestlands greater than 5,000 acres and 42 blocks between 1,000 and 5,000 acres.

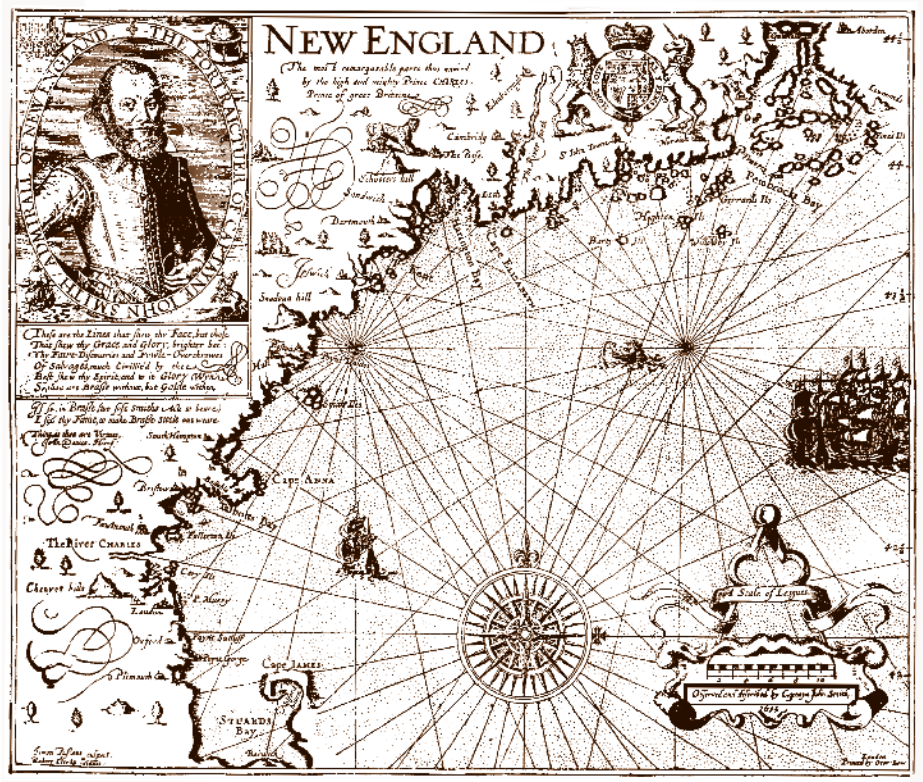
HISTORY

Over the past four centuries human impacts to the landscape evolved from the small-scale alterations of land cover by Native Americans and early Europeans (small transitory settlements) to landscape-scale manipulations (farms and towns replacing forest) to the significant replacement of natural cover today with large developments (houses, business parks, malls).

This course of events has directly impacted and altered the processes of water interception, infiltration, and runoff that determine the magnitude of flooding, water retention, and water quality. The trends that have most influenced these changes have been population growth, housing, agriculture, forestry, transportation and power generation. A new emerging trend as the 21st century begins is climate change – also human influenced.

Human influences in the Greater Piscataqua region of Maine and New Hampshire have been evident for 11,000 years. Native Americans (Abenaki, Sokaki and Saco peoples) established thriving cultures in the region using the coastal rivers that provided fresh water, transportation routes, abundant fish, shellfish, sites for agriculture, and access to lowland wildlife. They minimized the alteration of the landscape through seasonal settlements and migrations (Cronon, 1983).

Martin Pring was the first European to document his visit to this area, exploring the Piscataqua River in 1603. European immigration in what would become Southern Maine began sporadically in the late 1630s. Kittery (1623) and Berwick (1631) were some of the



John Smith's map of New England, 1614.

first sites of European settlement. Early European settlers made their livelihood from the coast, adjacent marshes, and nearby uplands, which had been inhabited by Native Americans but largely abandoned as the result of disease epidemics. As all early transportation was by boat, the coastal river mouths served as harbors and the protected coastal marshes and nearby uplands up to the head of tide quickly became the centers of commerce with piers, garrisons, shipyards, roads, and water-powered mills (Cronon, 1983).

European agriculture and settlement resembled that of the Native Americans at first, with minimal impacts on the land and in the sea. Practices changed with the arrival and proliferation of livestock and the steadily increasing number of settlers. Due to the scarcity of labor and materials, livestock were allowed to roam freely and spent much time in the lush grasslands of the marshes. Agriculture stayed at a subsistence level until the arrival of sheep, weaving technology, and improved technology to harness water power following the War of 1812. Textile mills sprung up along the main river stems and tributaries of the Cocheco and Salmon Falls rivers, attracting workers and populating town centers up through the 1850s. This was combined with improvements in regular shipments by ship and later by rail. In the 40 years following the War of 1812, the region was nearly completely deforested for pasture and croplands (Cronon, 1983).

Local agriculture declined in the period following the Civil War and tourism first appeared as "farm stays," and grew to include camps in the woods and on ponds. The railroad arrived in 1842, followed by local

trolleys in the early 1900s. Ease of transportation greatly enhanced visitor access from both Boston. Roads were improved and bridges were constructed over rivers with the coming of the automobile. Those trends have continued to the present day as tourism makes up the largest part of the Southern Maine economy.

The shifting in transportation from water to rail and roads allowed the centers of commerce and activity to shift away from the estuaries and gave rise to downtowns away from the immediate waters edge. This provided a century or so for estuarine shorelands to recover and return to the more natural conditions existing prior to European settlement. However, the past several decades have shown a renewed interest in locating residences along waterways and once again displacing natural land cover with a developed one. In 2005, 373,140 people lived in the combined area of the Piscataqua and the Hampton-Seabrook estuaries representing 14% of the combined population of the two states. This is more than three times the population in 1930. Growth predictions have these communities continuing to have the largest population gains in both states.

LAND USE

Land use and land cover have a direct impact on water quality. Biological processes in forests and wetlands break down pollutants and consume nutrients. Human-created landscapes tend to pollute and degrade water quality. Sources of pollution include petroleum and sediment from roadways and parking lots, pesticides and fertilizers from agriculture and lawns, human waste from sewage treatment plants and septic systems, and air pollution from automobiles and power plants. This pollution washes easily from hardened surfaces and is transported by stormwater runoff into streams, lakes, rivers, and bays.

As of 2006, 85% of the land cover within the Maine portion of the watershed remains in a largely natural condition – a complete reversal from 150 years ago. The remaining 15% has been either developed (5%) or in farmland (9%) or is currently bare (1%). Land cover is important because as the impervious surface cover (roads, roofs, parking lots) approaches 10%, scientific studies have shown that water quality in a river drainage significantly deteriorates.

As would be expected, as population increases so do impervious surfaces. Two of the towns in Maine's Piscataqua Region watershed are approaching, and two have already reached or exceeded, the 10% threshold. However the increase is not simply due to population growth as the impervious surface per capita (amount per each person) is also increasing (PREP, 2009). This

LAND COVER IN THE MAINE PORTION OF THE PISCATAQUA REGION WATERSHED (WELLS NERR 2006 AERIALS)

LAND USE	ACRES TOTAL	% OF LAND COVER	ACRES TOTAL IN WATERSHED	% OF LAND COVER IN WATERSHED
DEVELOPED	18,069	7%	8,570	5%
FARMLAND	20,887	8%	14,897	9%
WETLANDS	9,334	4%	4,683	3%
FORESTED WETLANDS	23,780	9%	13,596	9%
FOREST	164,229	63%	99,674	64%
GRASS /SHRUB LANDS	15.887	6%	9,828	6%
WATER	4,901	2%	4,422	3%
BARE LAND (NO VEGETATION)	1,649	1%	982	1%
TOTAL	**258,796**	**100%**	**156,106**	**100%**

increase is occurring in every town whether rural or developed.

Another increasing trend with water quality implications is the use of home yard pesticides that is occurring despite growing awareness of their negative environmental and human impacts. In Maine pesticide purchases have risen from 800,000 pounds in 1995 to 2,900,000 pounds in 2004 – much of it water soluble. This is a three fold increase in only 10 years and is currently equal to over 2 pounds per resident. These figures do not include pesticides used in agriculture, business, or industry.

IMPERVIOUS SURFACE COVER (%) IN 10 MAINE TOWNS LOCATED IN PREP STUDY WATERSHED

	1990	2000	2005
KITTERY	8.1	11.8	13.8
ELIOT	4.1	7.4	9.2
YORK	4.3	7.1	8.3
SOUTH BERWICK	2.3	3.9	4.7
WELLS	3.8	6.0	7.4
NORTH BERWICK	2.2	3.5	4.2
BERWICK	2.6	4.4	5.4
SANFORD	5.8	9.0	10.0
LEBANON	1.8	3.0	3.7
ACTON	1.5	2.5	2.9

UNH COMPLEX SYSTEMS RESEARCH CENTER

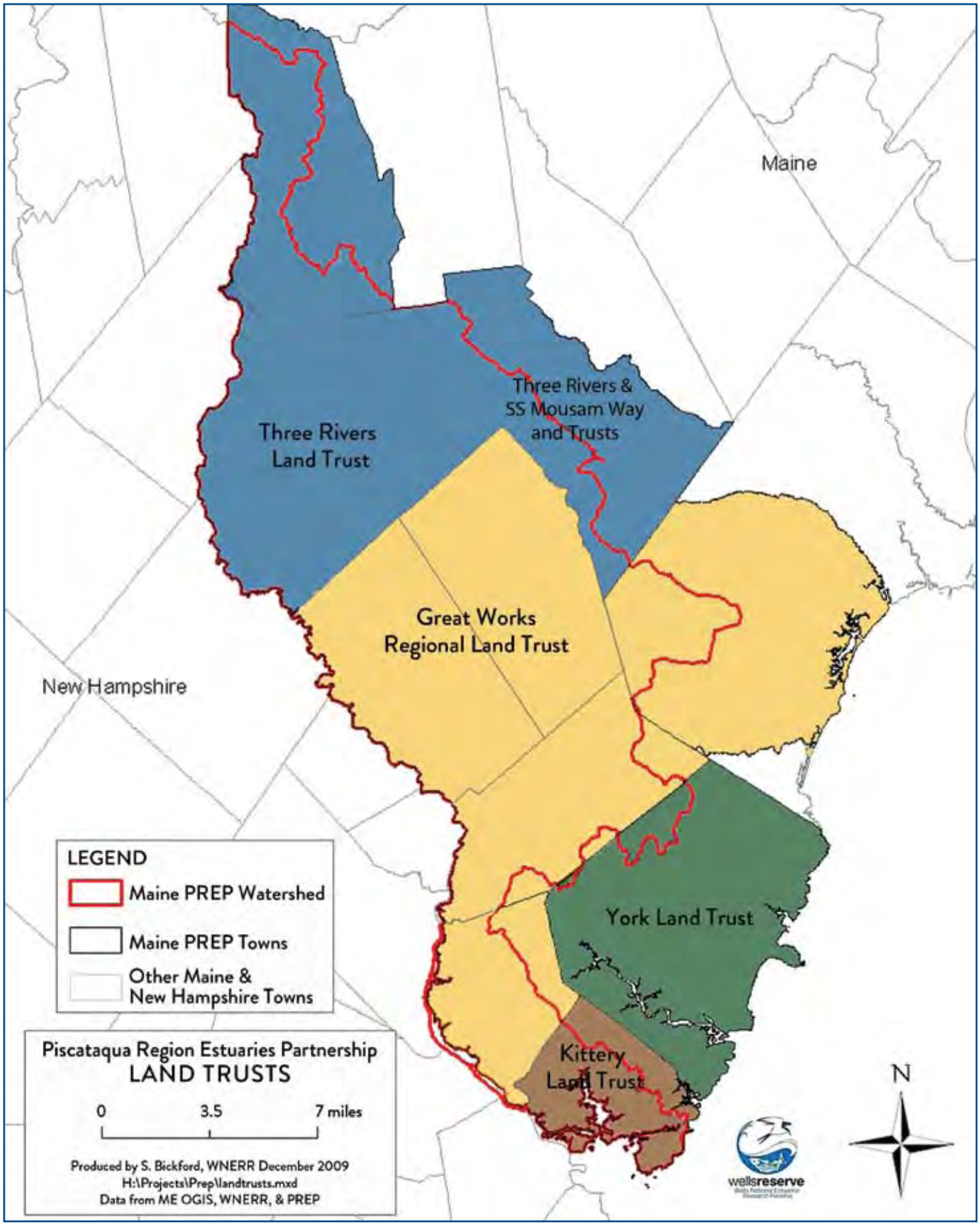
STATUS OF LAND CONSERVATION

The permanent protection of land is one way to ensure that a natural landscape will remain intact and able to provide the qualities of clean water and wildlife habitat plus other values such as recreation, scenic views, forest products, and food. Permanent land protection can occur through several legal mechanisms. Protection is the result of the limiting or extinguishing development rights on a parcel of land. This can occur either through conservation easements, land set asides, zoning restrictions or ownership by government entities and non-profit organizations (land trusts) dedicated to keeping land in its natural condition.

Efforts to permanently conserve land have increased markedly in the past 25 years with the growth of community-based non-profit land trusts. In 1985 there were no land trusts in the Maine Piscataqua watershed towns. Today, there are five (Kittery, York, Great Works Regional, Three Rivers, and Mousam Way) covering all 10 towns in the watershed. These organizations are augmenting efforts by state agencies (Department of Conservation, Bureau of State Parks, Inland Fisheries and Wildlife) and federal agencies (U.S. Fish and Wildlife, Wells and Great Bay National Estuary Research Reserves, U.S. Department of Agriculture) to permanently protect and manage natural resources. Municipalities have also worked to protect natural areas, often through

JEAN NOON

East Bank of the Salmon Falls River from The Three Rivers Land Trust's Salmon Falls Reserve, Lebanon Maine.


Maine
Three Rivers Land Trust
Three Rivers & SS Mousam Way and Trusts
Great Works Regional Land Trust
New Hampshire
York Land Trust
Kittery Land Trust
LEGEND
Maine PREP Watershed
Maine PREP Towns
Other Maine & New Hampshire Towns
Piscataqua Region Estuaries Partnership
LAND TRUSTS
0
3.5
7 miles
Produced by S. Bickford, WNERR December 2009
H:\Projects\Prep\landtrusts.mxd
Data from ME OGIS, WNERR, & PREP
N
wellsreserve

LAND CONSERVATION BY OWNERSHIP (WELLS NERR 2009)

CONSERVATION OWNERSHIP	TOTAL 10 TOWNS (in acres)	% OF CONSERVATION LAND	WITHIN PISCATAQUA WATERSHED (in acres)	% OF CONSERVATION LAND WITHIN WATERSHED
FEDERAL	2,366	10%	175	2%
STATE	3,824	16%	2,089	23%
TOWN	2,865	12%	1,387	15%
NON-PROFIT	8,488	36%	4,943	55%
WATER DISTRICTS	6,365	27%	361	4%
TOTAL	**23,439**		**8,955**	

the efforts of citizens serving on town conservation commissions.

As of 2009, there are 24,378 acres of permanently protected land in the 10 towns representing 9% of the total area. 35% (8,488 acres) of these conserved properties have been protected in the past 20 years by non-profit organizations such as land trusts. The rest has been protected by state and federal agencies and municipalities. Water districts also own land and while it is maintained in a natural condition its protection is not permanent.

Of the total of 24,378 acres of conserved land in the ten towns, 8,955 are located within the Piscataqua watershed representing 5.7% of the total watershed area. PREP has established a benchmark of permanently conserving 15% of the land in the watershed (23,400 acres) by 2020. Therefore only 38% of the land area needed to reach the 2020 target goal is currently protected.

Mt. Agamenticus.

The towns vary greatly in the degree of Piscataqua watershed land conserved, from 69% in York to only 1.8% in Acton. This variance is due to several factors. In York there has been a concerted and 20-year effort to protect lands in the Mt. Agamenticus area, which contains numerous headwater streams that drain into the Piscataqua. This effort has been supported by scientific studies showing the area's importance and by funding from local, state, federal, and private entities coordinated by a coalition of ten partnering organizations (Mt. Agamenticus to the Sea Conservation Initiative).

In Acton, the landscape remains largely in a natural condition with forests and farms. Development pressure, while growing, remains low compared to more southern and coastal communities. The regional land trust (Three Rivers) is the youngest in the area, becoming established in 2000.

Riparian lands along rivers and streams and adjacent to wetlands are critical in determining water quality.

LAND CONSERVATION BY TOWN (WELLS NERR 2009)

	TOTAL ACRES	ACRES CONSERVED	% OF ACRES CONSERVED	ACRES IN WATERSHED	ACRES CONSERVED IN WATERSHED	% OF ACRES IN WATERSHED CONSERVED
KITTERY	11,062	1,593	14.4%	7,842	1,089	13.9%
ELIOT	12,755	581	4.6%	9,628	218	2.3%
YORK	35,556	7,524	21.2%	1,755	1,219	69.5%
SOUTH BERWICK	20,704	3166	17.6%	17,803	2,532	14.2%
WELLS	36,504	5548	15.2%	6,680	411	6.2%
NORTH BERWICK	24,414	704	2.9%	24,414	704	2.9%
BERWICK	24,220	943	3.9%	24,220	943	3.9%
SANFORD	31,193	2,027	7%	12,190	645	5.3%
LEBANON	35,625	922	2.6%	35,625	922	2.6%
ACTON	26,401	431	1.6%	14,634	272	1.8%
TOTALS	**258,796**	**23,439**	**9.1%**	**156,106**	**8,955**	**5.7%**

There are currently 45,534 acres of riparian land (using Maine Inland Fisheries and Wildlife Beginning with Habitat definition for riparian habitat) remaining in natural condition within the Maine portion of the watershed. 11% (5,634 acres) has already been developed or converted (lawns, agriculture, etc.). 12% (6,058 acres) has been conserved.

In the 10 Maine communities conservation efforts have not focused on the Piscataqua watershed to date. Despite 9.1% of the land in the towns overall being conserved, only 5.7% of the land is protected within the watershed boundary. The same is true for riparian lands where 12% is protected throughout the communities but only 7% for the actual Piscataqua drainage. However with 90% of the riparian lands and 94% of land cover (including farmland) still intact in a natural condition, the opportunities for protection are abundant.

To increase attention to the existing opportunities and the relationships between land cover and clean water this plan has identified 25 Conservation Focus Areas (CFAs)

STATUS OF RIPARIAN LANDS (WELLS NERR 2009)

	TOTAL ACRES	RIPARIAN ACRES*		RIPARIAN ACRES DEVELOPED**		RIPARIAN ACRES IMPAIRED**		RIPARIAN ACRES NATURAL**		RIPARIAN ACRES CONSERVED**	
10 MAINE TOWNS	258,796	51,169	20%	2,938	6%	2,696	5%	45,534	89%	6,058	12%
PISCATAQUA WATERSHED IN MAINE	156,106	29,148	19%	1,158	4%	1,685	6%	26,305	90%	1,983	7%

* using the definition of riparian buffer from Maine Inland Fisheries and Wildlife Beginning with Habitat
** percentage of riparian acres

JEAN NOON

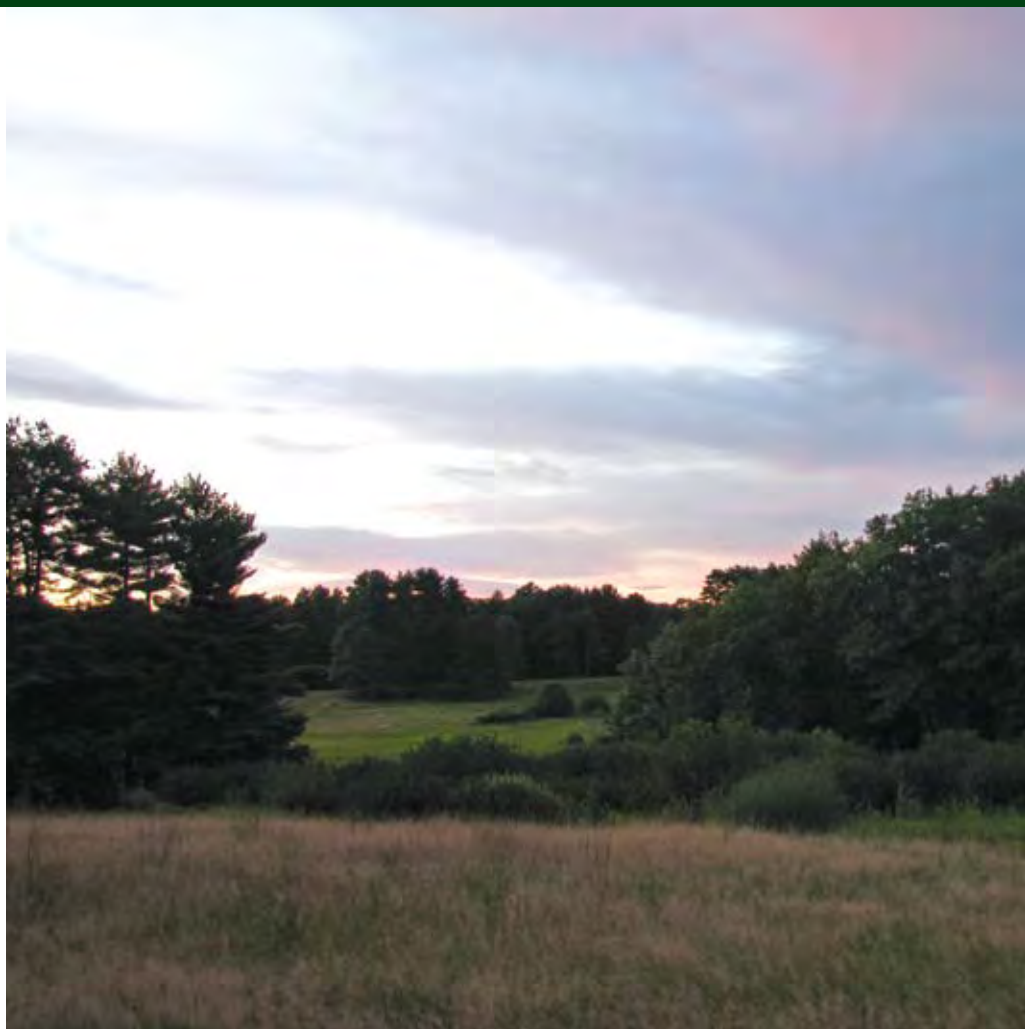
Pocket Swamp in the Maine Natural Areas Program Focus Area Walnut Hill in Shapleigh, Maine.

– see Section III. These are areas of exceptional significance for protecting living resources and water quality. Within the 18 towns covered by this plan, 25 CFAs were mapped covering 85,642 acres within core CFA areas and an additional 74,523 acres of supporting landscape. Within the Piscataqua watershed portion of Maine, CFA Core Areas make up 19.5% of the land area. Currently only 14% of the land in these Conservation Focus Core Areas is permanently protected as contrasted with 27% of CFAs in New Hampshire. As in New Hampshire, the Maine CFAs will be a priority for PREP's conservation efforts and funding.

Future efforts to coordinate protection of the watershed will need to include the five land trusts. All are actively working on land acquisition efforts. There are a total of 62 active Board members working for these organizations. Two of these land trusts (York and Great Works) have professional staff and maintain offices. In 2009, the Great Works Regional Land Trust completed a conservation plan for the six towns of Eliot, the three Berwicks, Wells, and Ogunquit that identified forests, farms, and water as the key components of the landscape to protect.

The Mt. Agamenticus to the Sea Conservation Initiative is a coalition of ten partners that have been working together since 1988 and have conserved 8,364 acres (as of 2009) within a 48,000-acre focus area in the six towns of Wells, Ogunquit, South Berwick, Eliot, York, and Kittery. The ten coalition partners are: York Land Trust, Kittery Land Trust, Great Works Regional Land Trust, York Rivers Association, Maine Coast Heritage Trust, Trust for Public Lands, the Nature Conservancy, Maine Department of Inland Fisheries and Wildlife, Rachel Carson Wildlife Refuge, and the Wells National Estuarine Research Reserve. The Kittery and York Water Districts own an additional 4,187 acres for a total of 12,551 acres of land in conservation management. The Mt. Agamenticus focus area includes 14,645 acres in the Piscataqua watershed and currently 3,984 acres conserved. This effort is responsible for 65% of the Piscataqua River watershed in York being protected.

SECTION III: IDENTIFYING SIGNIFICANT NATURAL RESOURCES & CONSERVATION FOCUS AREAS



As noted in Section I, a principal goal of this plan is to identify and describe a portfolio of areas that represent the best opportunities to conserve the critical ecological, biological, and water resources of southern Maine's coastal watersheds, based on available information. In this section, the approach taken to identify and evaluate significant natural resources and Conservation Focus Areas (CFAs) is described, and CFA attributes are described in detail via tables and maps.

GENERAL APPROACH

To most effectively guide strategic conservation at the local level in a manner that successfully addresses regional priorities, the Piscataqua Region Estuaries Partnership (PREP) has identified 25 Conservation Focus Areas (CFAs) intended to highlight the best opportunities at the municipal scale to protect lands that provide multiple regionally significant habitat and water quality benefits. In 2006, *The Land Conservation Plan for New Hampshire's Coastal Watersheds* was published, and created New Hampshire's first designation of CFAs within the Piscataqua watershed. Similarly, in 2001 Maine's Beginning with Habitat (BwH) program had designated Focus Areas of Statewide Ecological Significance. It has since refined these focus area boundaries based on growing recognition of the region's biological richness, new discoveries of rare plant and animal occurrences, and human-induced changes to the landscape that have occurred since initial focus area designations.

As PREP began considering an update of the land conservation plan to include Maine's portion of the watershed, a decision was made to not re-invent focus areas independent of the BwH approach. Rather the steering committee decided to use existing data driving BwH's Focus Area designations and incorporate them into a watershed wide co-occurrence model. These would more clearly identify local conservation "hot spots" both within BwH designated state focus areas, and in areas where statewide significance designations might not have been appropriate but where local actions could protect regionally significant habitats. This section describes the approach used to identify and evaluate significant natural resources in designating CFAs for the purposes of local conservation

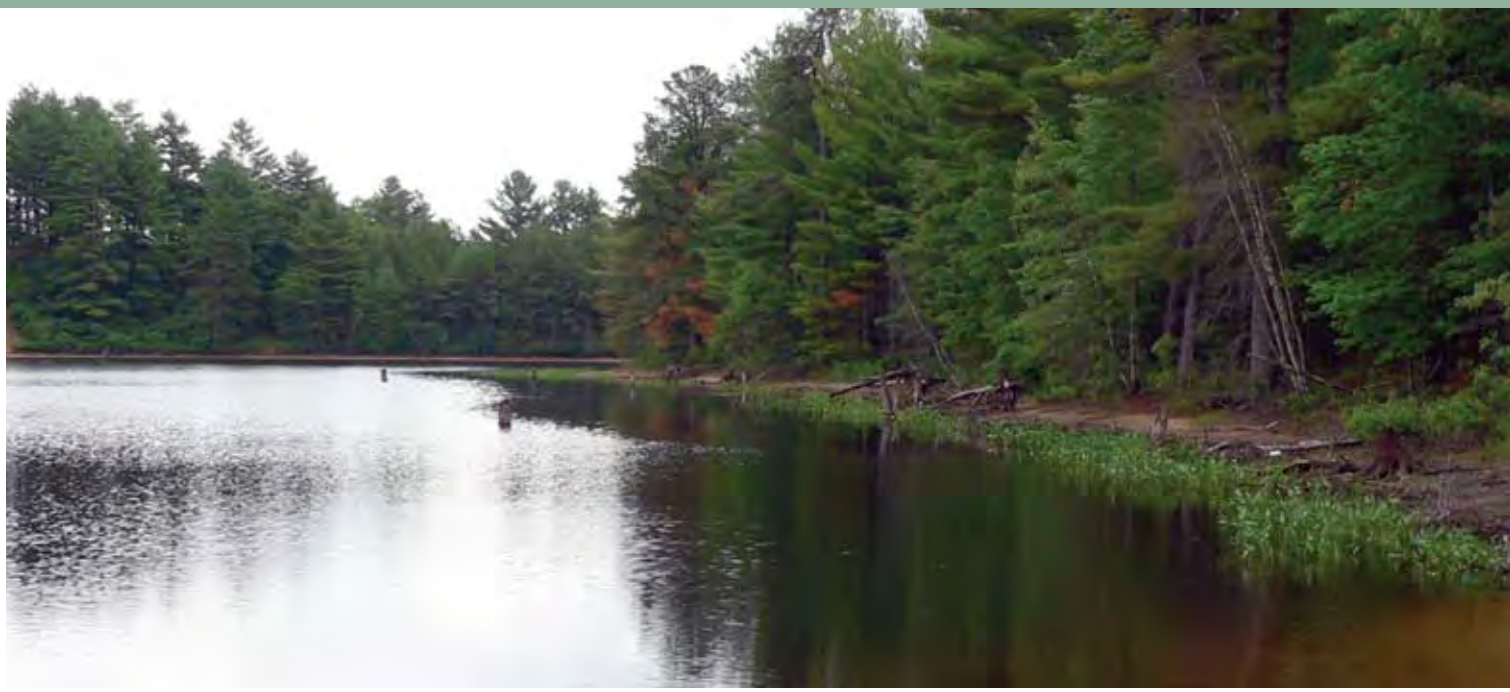
planning necessary for the successful implementation of plan goals.

To identify areas of high significant resource co-occurrence, we used the following approach:

- Employ a science-based approach utilizing existing BwH data.
- Develop criteria based on expert opinion to highlight the most significant natural resource features from a regional perspective.
- Incorporate documented natural resource features and predictive GIS modeling into a co-occurrence model that could be applied consistently throughout the watershed.
- Analyze data at the spatial scale of multiple towns and watersheds.
- Synthesize information to identify focal areas for conservation attention.
- Solicit review by local experts and resource agency staff.
- Cross reference results with existing conservation plans at local, state, and federal levels.

BwH has been providing information to the 10 Piscataqua River watershed towns in Maine for several years and has therefore become a well-recognized service among local planners and the conservation community. Much of the data incorporated in the BwH data package is now required for completion of local comprehensive plans and is often used to pre-screen local development projects. As a result of this local familiarity with BwH data, the project steering committee felt it prudent to base the GIS co-occurrence modeling efforts largely on the existing BwH data sets. The use of BwH data allowed the project team to best highlight those lands and waters known to be important for conserving **living resources** – native plants, animals, and natural communities – and offered a starting point for assessing the relative "intactness" of forests and riparian buffers necessary to protect **water quality**. In light of today's challenges of increased landscape fragmentation and future challenges associated with climate-induced species range shifts, landscape-scale conservation (protecting large areas that offer the greatest chance to support viable habitat under increased pressure) is likely the best approach to planning for a resilient and functional landscape for future generations. In designating CFAs the steering committee paid particular attention to remaining unfragmented landscapes best capable of supporting future ecological functions, and where local conservation efforts would address the greatest number of state conservation priorities as outlined in Maine's State Wildlife Action Plan.

In an attempt to properly evaluate natural resource elements in their landscape context, the co-occurrence model did not artificially 'clip' data sets to the limits of the Salmon Falls/ Piscataqua River watershed. Rather, if a portion of a town fell within the watershed boundary, resources within the entire town were included in modeling efforts in hopes that a town-wide consideration of high value resources would better assist local planning efforts. Similarly, lands within three miles of the watershed break were also included in the GIS modeling efforts to better account for supporting landscapes such as large unfragmented forest blocks and mapped significant wildlife features that extend beyond the limits of the watershed. As a result, the process has resulted in identifying numerous conservation focus areas that fall outside of watershed boundaries, but that meet the scoring criteria developed by the project's expert panel. We felt that including modeling results that fell outside of the primary focus of this plan (the Piscataqua River watershed) was warranted to assist other planning efforts within the southern Maine region. Thus, the CFAs identified, described, and mapped in this plan covers 18 Maine municipalities instead of just the 10 Maine communities that contain land within the Piscataqua River watershed.



IDENTIFYING, ANALYZING, AND MAPPING SIGNIFICANT NATURAL RESOURCES

The project steering committee identified six categories of key natural resource features from existing BwH data that best address the conservation plan priorities of living resources and water quality:

1. Unfragmented habitat
2. Riparian zones on freshwater and tidal rivers, streams, lakes, and ponds
3. Significant Wildlife Habitats as mapped by MDIF&W
4. Rare, threatened, and endangered plant and animal occurrences
5. Habitat for USFWS Priority Trust Species
6. Rare and exemplary natural communities

These resource categories informed which individual GIS data sets would be used to build a resource co-occurrence model consistent with methods utilized in New Hampshire. The intended goal of the resource co-occurrence model is to aid in identifying areas where several resource values coincide and overlap, thus signaling locations with multiple conservation values and potentially higher priority for protection. The principal natural resource categories and data layers from each category incorporated into our co-occurrence model are described below.

Unfragmented Habitat

For the purposes of the co-occurrence model, this resource category was broken down to include undeveloped habitat blocks and unfragmented forest blocks (both resource types identified on typical BwH Map 3 Undeveloped Habitat Blocks). As delineated, undeveloped habitat blocks include several habitat types including grasslands, non-forested wetlands, and a variety of forest cover types. The boundaries of an unfragmented habitat block are determined using satellite imagery data to "clip" out areas that are developed, paved, or stripped of natural vegetation. The result is a 'block' of the landscape unbroken by improved roads, structures, and other impervious surfaces that pose some degree of barrier for species movement. Unfragmented forest blocks are the next level of data refinement from the more general unfragmented habitat blocks. The forest blocks are large, contiguous forests often containing several stand types and ages, wetland and upland, that together are at least 500 acres in size and are located 500 feet from the nearest improved road or developed area to best capture "interior" or buffered forest habitat conditions.

Both the habitat block and forest block features are critical for a variety of wildlife species that have large home range requirements and are sensitive to human disturbances. Conservation of large unfragmented acreage provides multiple human benefits as well including long-term maintenance of a landscape that can support traditional outdoor recreation, natural resource industries, aquifer

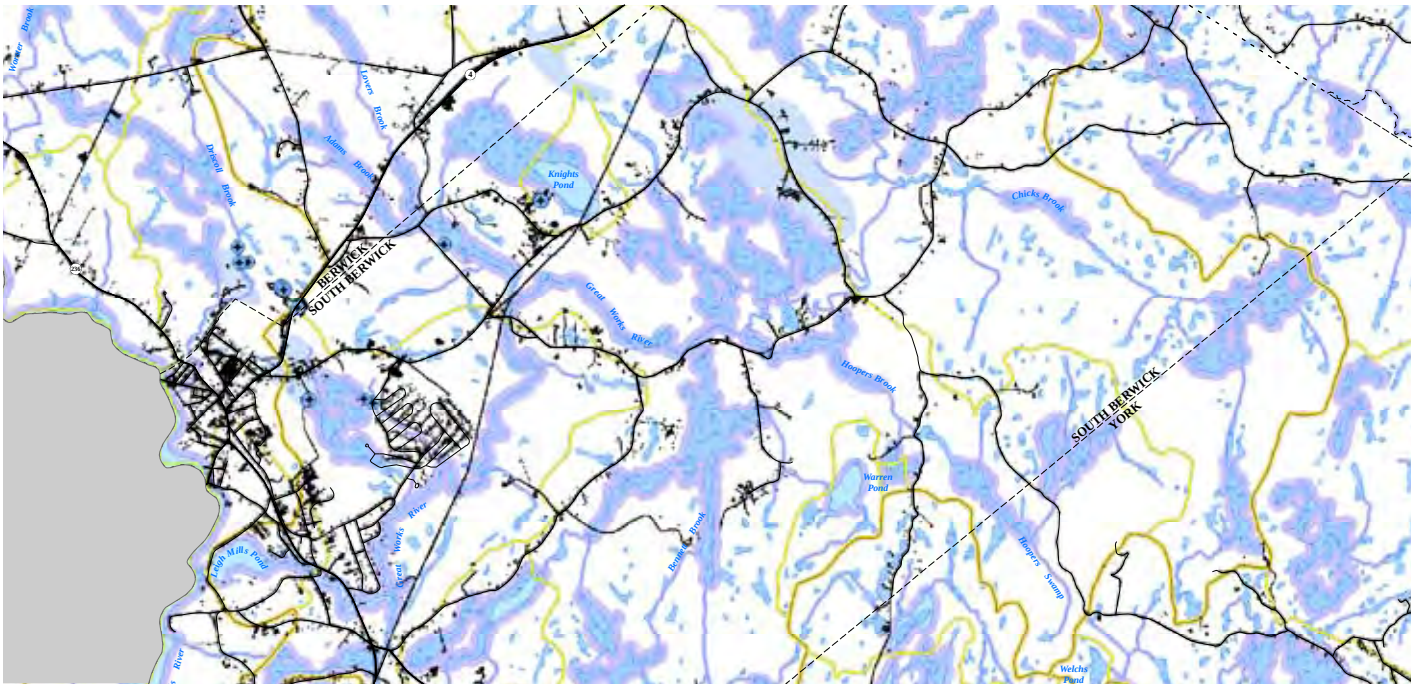
and surface water protection, and potential for carbon sequestration.

The significance of blocks varies with size and region. In the 10 town Piscataqua watershed area of Maine, 45 forest blocks over 500 acres occur. Only 8 (17%) of these blocks are 1,500 acres or larger. Accordingly, the committee scoring data layers for the co-occurrence model attributed more weight to these larger blocks to better highlight their regionally significant conservation value. To enable a weighted score that reflects size-based significance of study area blocks, the data sets were broken down into undeveloped habitat blocks of 200-800 acres, 800-1400 acres, >1,400 acres, and unfragmented forest blocks 500-800 acres, 800-1500 acres, and >1,500 acres. Each of these 6 sub-categories of remaining undeveloped habitats were then weighted appropriately and incorporated into the co-occurrence model.

Riparian Zones

Riparian areas play a crucial role in protecting surface water quality from non-point runoff, bank erosion, and excessive solar warming. Not only do riparian habitats support most of Maine's terrestrial species during various seasons and life stages, riparian habitats provide natural landscape connectivity and facilitate species movement between preferred habitat types. Maintenance of riparian habitat is critical regardless of water body type. Recent studies have clearly demonstrated the ecological importance of small first order streams within upper watershed areas. Without adequate buffering, the functions and values of these small and often overlooked resources will decline and impact downstream waters, habitats, and human interests.

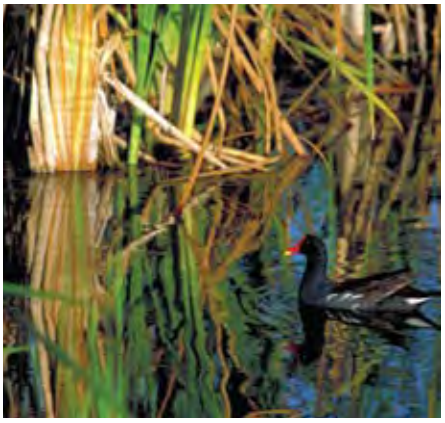
To capture the extent and diversity of riparian resources, we included 7 specific subcategories of riparian habitat types into the co-occurrence model. These subcategories included lands within 250 feet of coastal wetlands, lands within 250 feet of rivers, lands within 250 feet of great ponds, and lands within 250 feet of freshwater wetlands greater than 10 acres in size. The model also includes lands within 75 feet of streams and an additional data set that identifies stretches of streams that occur within unfragmented forest blocks. The intent of this last category was to capture those streams with the most intact riparian buffers and least influence of non-point source pollution. Ponds that support native brook trout populations "Heritage Brook Trout Ponds" were also given a score to highlight open water habitats that maintain relatively intact aquatic communities. Most of these data subcategories are depicted on typical BwH Map 1 Water Resources & Riparian Habitats (see below).



A detail of BwH Map 1 Water Resources & Riparian Habitats for South Berwick

Significant Wildlife Habitats

The Maine Department of Inland Fisheries and Wildlife has the responsibility of mapping Significant Wildlife Habitats that are ultimately regulated by the Maine Department of Environmental Protection under the Natural Resources Protection Act. These habitat types include:



USFWS

Inland wading bird and waterfowl habitat: freshwater ponds, marshes, and shrub swamps of the size and vegetation diversity necessary to support multiple priority wetland associated bird species requirements for breeding and migratory stop-over habitat.

Tidal wading bird and waterfowl habitat: coastal marshes, mudflats, eel grass beds and similar intertidal and shallow sub-tidal habitats that provide significant breeding and migratory stopover sites for ducks, herons, and similar coastal species.

Seabird nesting islands: off-shore ledges and larger islands that support breeding sea ducks, alcids, gulls, cormorants, heron rookeries and other coastal water dependent species.

Shorebird feeding and roosting areas: shorebird feeding areas consist of intertidal mudflats where significant shorebird numbers and species diversity have been recorded during spring and fall migration surveys; shorebird roosting areas also include ledges, salt marshes, and beaches.

Deer wintering areas: typically softwood-dominated forest stands or south-facing slopes where snow accumulation is generally less than surrounding areas thereby facilitating deer movement and access to browse in winter months.

Significant vernal pools: vernal pools are typically shallow, fishless, freshwater basin wetlands that support standing water through mid-summer. These habitat types are critical habitat for several species of amphibians and reptiles that feed on amphibians and their egg masses. Significant pools are those that, through on-site investigations, have been determined to support large numbers of breeding amphibians or habitat for listed rare, threatened, and endangered species.

The Blanding's Turtle, an example of a rare animal occurrence.

Although land uses are regulated within and adjacent to Significant Wildlife Habitats under existing MDEP requirements, development is still allowed if it meets certain standards. The best long-term protection for these valuable areas is conservation both of the habitat itself and supporting landscapes that buffer specific resource types and facilitate species movement into and out of the significant habitats.

Significant Wildlife Habitat data included in this category is depicted on typical BwH Map 2 High Value Plant and Animal Habitat maps formatted for individual watershed towns.

Rare, Threatened, and Endangered Plant and Animal Occurrences

Both the Maine Department of Inland Fisheries and Wildlife (MDIF&W) and the Maine Natural Areas Program (MNAP) track known occurrences of rare, threatened, and endangered plants and animals throughout the state. Occurrences are documented during eco-regional surveys that target habitats with conditions likely to harbor listed species, during development project review site investigations, or during parcel specific investigations conducted at the request of the landowner. Only a small portion of the Piscataqua River watershed lands in Maine have been field surveyed.

Animal occurrences in the state database are typically mapped using a one-quarter mile radius circle to account for species movements within appropriate habitat in the immediate vicinity of recorded sighting. Some records however, are mapped with polygons depicting preferred habitat type (i.e., boundaries of a grassland known to support a listed grassland bird species). Field verified plant occurrences are mapped based on GPS locations of plant populations or field sketched boundaries of large stands.

For the purposes of the co-occurrence model, data sets were broken into subcategories based on species rareness (endangered, threatened, or special concern) and greater weight was allocated to plant and animal species listed as endangered with less weight given to threatened and special concern species respectively. For the purposes of the animal data, weighting was applied to the entire ¼ mile circle of mapped habitat polygon. A 250-foot buffer was placed around plant occurrences to account for lands surrounding mapped populations. The buffers are important for both plant population protection and for potential population expansion.

The plant and animal data included in this category is depicted on typical BwH Map 2 High Value Plant and Animal Habitat maps formatted for individual watershed towns.

Habitat for USFWS Priority Trust Species

In attempt to inform protection of habitat for its Priority Trust species, the U.S. Fish and Wildlife Service's Gulf of Maine Coastal Program (USFWS) completed a project to predict, map and rank likely important habitat for 91 species that regularly inhabit the Gulf of Maine watershed and that meet the following criteria:

- federally endangered, threatened, and candidate species,
- migratory birds, anadromous and estuarine fish that are significantly declining nationwide,
- migratory birds, anadromous and estuarine fish that have been identified as threatened or endangered by two of the three states in the Gulf of Maine watershed.

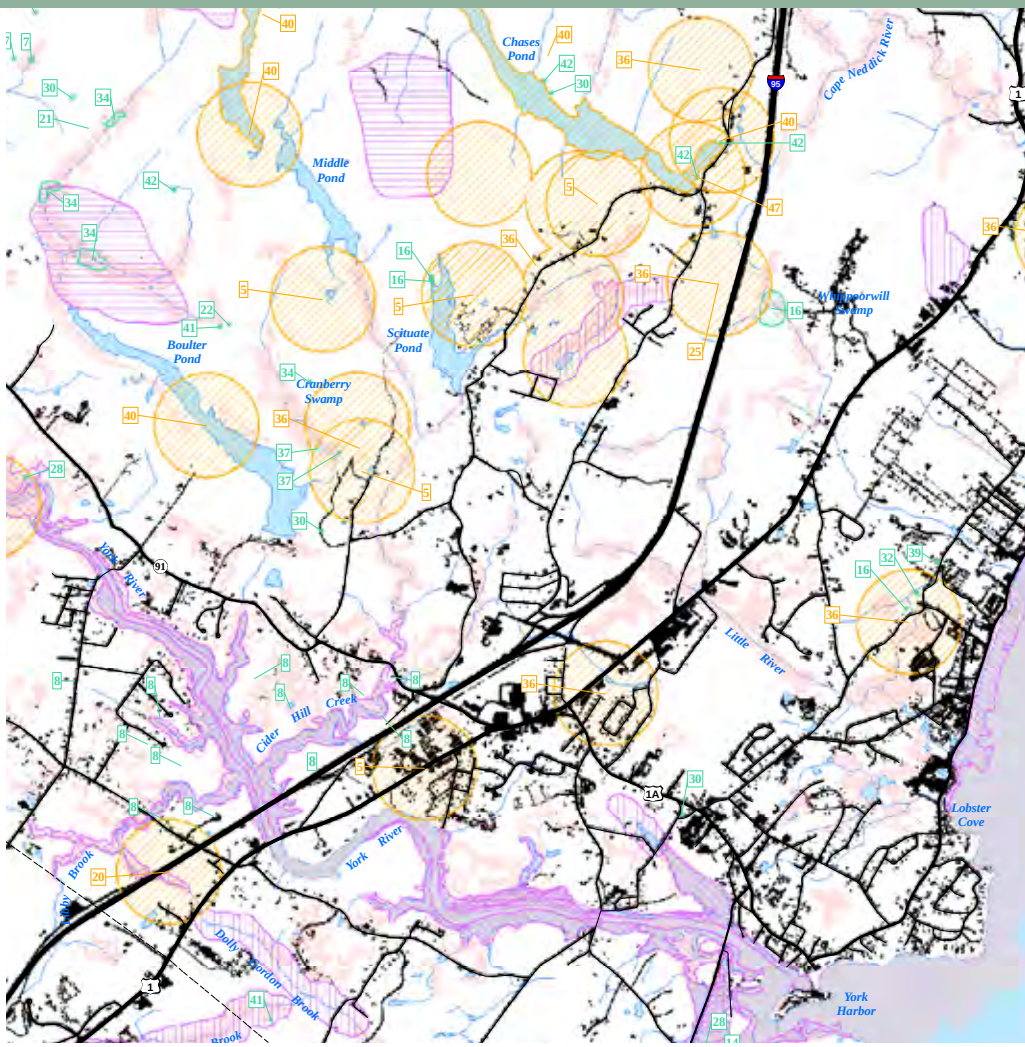
The lands predicted to represent the top 25% relative habitat value in each of four general habitat types (saltwater, freshwater, grassland, forest) have been included in this co-occurrence model. These predicted areas are based on satellite land cover data and literature review of species habitat preferences. The top value habitats identified through the USFWS process are depicted on typical BwH Map 2 High Value Plant and Animal Habitat maps formatted for individual watershed towns and complete USFWS results are depicted on BwH Map 8 USFWS Habitats for Priority Trust Species.

Rare and Exemplary Natural Communities

The Maine Natural Areas Program (MNAP) has classified and distinguished 98 different natural community types (assemblages of plants that

regularly occur together in similar soil types, climatic conditions, and elevations) that collectively cover the state's landscape. These include such habitats as floodplain forests, coastal bogs, alpine summits, and many others. Each type is assigned a rarity rank of 1 (rare) through 5 (common) both within Maine (state rank=S) and globally (global rank=G). MNAP tracks examples of a natural community type ranked S1, S2, or S3, and outstanding examples (e.g., large, old growth stands) of S4 and S5 types. For the purposes of the co-occurrence model, communities ranked S1 through S3 were weighted based on rarity, and exemplary common communities were also given a scoring weight based on condition rank.

The rare and exemplary natural community data included in this category is depicted on typical BwH Map 2 High Value Plant and Animal Habitat maps formatted for individual watershed towns.



A detail of BwH Map 2 High Value Plant and Animal Habitat map for York.

RESOURCE CO-OCCURRENCE MODEL

The purpose of a resource co-occurrence model is to aid in identifying areas where several resource values coincide and overlap, thus signaling locations with multiple conservation values and potentially higher priority for protection.

For GIS modeling purposes, the 30 data sets discussed above - largely consisting of the data depicted on BwH Maps 1, 2, or 3 - were provided to an expert panel of natural resource professionals and community planners to establish the relative importance of each layer and to provide a layer-specific score for model weighting purposes. The panel participated in a facilitated Delphi process and individually assigned numerical importance to each layer. (Refer to Appendix C. for more detail on the expert stakeholder process).

The individual participant scores were then pooled to generate an average importance value used in the final GIS co-occurrence model. These scores were entered into a weighted sum model where values were stacked on a map pixel basis. Individual mapped areas scored from 0 (no features present) to 42.2 (high overlap of weighted data layers). Candidate Conservation Focus Areas were then designated by dropping areas scoring less than 10 and creating polygons from the remaining areas (those scoring >10) over 100 acres in size (threshold selected for lands capable of supporting populations of target species over the long-term). The resulting polygons were then used to guide decisions regarding the ultimate delineation of Conservation Focus Area cores and supporting landscapes.

DELINEATING CONSERVATION FOCUS AREAS

Twenty-five Conservation Focus Areas were identified through a systematic, state-of-the-art analysis of a wealth of natural resources data. Collectively, these areas comprise approximately 85,642 acres designated as Core Areas and an additional 74,523 acres of supporting landscape. A map of the region showing all CFA Core Areas and Supporting Natural Landscapes is shown at the beginning of Section IV.

Definitions

A **Conservation Focus Area** is *an area that is considered to be of exceptional significance for the protection of living resources and water quality in the coastal watersheds.* In general, focus areas occur in places where multiple important natural resource features co-occur to an extent that is significant from a whole-watershed perspective. Occasionally, focus areas emerged that contained only one or two important features, because the features were considered truly irreplaceable (e.g., habitat for a critically imperiled natural community, or endangered animal species).

Each Conservation Focus Area is comprised of a **Core Area** and a **Supporting Natural Landscape**.

- The **Core Area** is *the contiguous geographic area that contains the primary natural features and habitat for which the Conservation Focus Area was identified.* Core Areas contain essential habitat for plant and wildlife species of concern and exemplary natural communities, highest quality small watersheds and other vital freshwater features, irreplaceable coastal resources such as estuarine shoreline, and the best remaining examples of intact forest ecosystems. These unfragmented areas, which are wholly or almost entirely undeveloped, represent the highest priority for conservation and protection.
- The **Supporting Natural Landscape** *includes the surrounding area that helps to safeguard the Core Area while also providing habitat for many common species.* Supporting Natural Landscape contains buffer around the Core Area, undeveloped watersheds, and undeveloped forest blocks, helping to maintain ecological processes upon which habitats and species depend. Conserving Supporting Natural Landscapes will embed the Core Areas in a minimally fragmented and minimally disturbed matrix, thus helping to maintain the viability and quality of the Core Area natural features over time.

Delineation Methodology

Areas initially identified as higher value based on the co-occurrence model output were overlaid onto the most recent aerial photo coverage available to refine boundaries of core Conservation Focus Areas. The delineation of CFA Core Areas took into account existing patterns of development, forest stand condition, and proximity to undeveloped areas that may not have scored highly but that provide natural habitat buffering potential and landscape connectivity for species movement. Many of the resulting focus areas fell within previously identified BwH focus areas while others identified local hot spots that were not identified during the statewide BwH analysis.

Supporting Natural Landscapes were delineated beyond core focus area boundaries to:

1. ensure that the features within the mapped core area are surrounded with a sufficient undeveloped landscape to maintain their natural function and ecological integrity; and
2. identify areas likely to increase habitat connectivity between identified Core Areas. Habitat connectivity is critical to maintain genetic variability and to help maintain species resiliency as habitat condition and species ranges shift in response to climate change.

Focus area boundaries have been determined based on a combination of coarse and fine features. Coarse features ensure the inclusion of core driving resource values (rare plants and animals, rare and exemplary natural communities and ecosystems, and significant and essential wildlife habitats) along with the habitat connectivity necessary to maintain an ecologically functional landscape. Coarse features include local watersheds, unfragmented habitat blocks, and in some cases significant wildlife habitats in close proximity, but not determining factors in identifying Core Areas. Coarse features may also include features that help capture local habitat variability such as headwaters, and topographical gradients, so long as those features are an integral part of the functioning landscape as defined by the Conservation Focus Area.

Fine features include buffers to rare species, habitats, and aquatic features which predominantly guide the

fine-tuning stages of the delineation process. In locations where ecologically meaningful features occur that provide sufficient buffer, but are not overly inclusive of arbitrary areas of landscape, these features are used as the boundaries. Examples of these features may include water body buffers, roads, and margins of agricultural or developed land. In some cases a single consideration dictates the placement of a given section of a boundary line; in other cases multiple considerations dictate the placement of a given section of boundary. In some cases the placement of a boundary came down to professional judgment because of specific local knowledge and familiarity with local conditions.

Coarse Features

- Watershed boundaries (usually HUC 12)
- Unfragmented blocks
- Topography (ridgeline, valley, floodplain terrace, elevation etc.)
- Significant Wildlife Habitats
- Documented rare and exemplary natural communities and ecosystems
- Documented rare plants and animals

Finer Features

- Generic buffers to rare species and rare or exemplary natural communities and ecosystems
- Species-specific buffers/habitat requirements where relevant
- Water body buffers
- Connectivity between habitats or species occurrences
- Landscape management history (agriculture and forestry)
- Development patterns
- Site quality data from field investigations

LIMITATIONS OF THE DATA

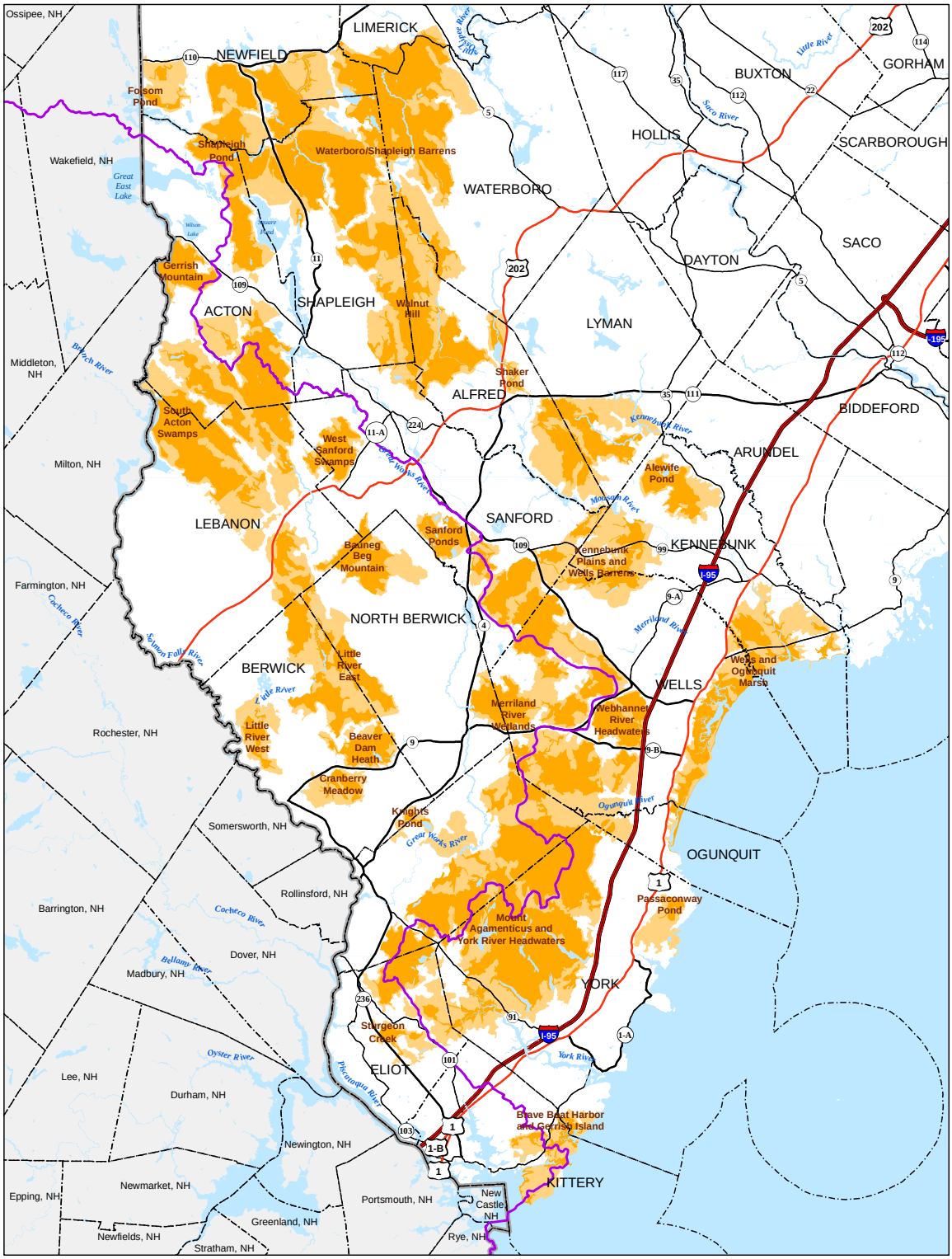
This conservation plan was developed using the best data available to members of the planning team. Based on the data described above, we know that Maine's coastal watersheds contain a wide range of significant ecological resources, and we have a pretty solid understanding of the location and status of certain resources. Nonetheless, our knowledge of the distribution and status of these resources is incomplete.

In some cases, it was impractical to carve out all existing development from a focus area, and so limited developed areas remained inside. We are not intending to suggest, however, that such development be removed from the landscape.

We acknowledge the limitations of existing data, and offer the following considerations for users of this plan:

- The plan should not be considered a definitive statement of the presence or absence of significant ecological resources at given locations. We are committed to increasing our knowledge of the distribution, abundance, and quality of conservation target occurrences in Maine's coastal watersheds, and we will use that knowledge to guide and refine our goals and strategies.
- The plan should be considered a *first iteration*, rather than the "final statement." We fully expect to supplement and otherwise revise the plan over time, in response to new information. As new information is acquired by state resource agencies (MDIF&W and MNAP principally) it will be added to updated BwH maps. BwH maps are the best source of information regarding individual resource drivers determining focus area determinations.
- We do expect that additional important areas could emerge as a result of new information.
- We do not expect that future information will suggest the elimination of any of the important habitat areas identified in the plan, except perhaps in the event that shifting human land uses destroy or significantly degrade an area. The conservation focus areas are well justified, though new information may enable us to adjust boundaries, connectivity zones, and other attributes.

Notwithstanding acknowledged data limitations, we believe this plan to be a highly credible first iteration based on sound scientific data, expert consultation, and sophisticated GIS modeling and conservation planning tools.


Ossipee, NH
LIMERICK
NEWFIELD
Folsom Pond
Shapleigh Pond
Waterboro/Shapleigh Barrens
Wakefield, NH
Great East Lake
WATERBORO
HOLLIS
BUXTON
GORHAM
SCARBOROUGH
SACO
DAYTON
LYMAN
Gerrish Mountain
ACTON
SHAPLEIGH
Walnut Hill
Middleton, NH
Shaker Pond
ALFRED
BIDDEFORD
South Acton Swamps
West Sanford Swamps
Milton, NH
ARUNDEL
Alewife Pond
LEBANON
SANFORD
Sanford Ponds
Bauneg Beg Mountain
KENNEBUNK
Kennebunk Plains and Wells Barrens
Farmington, NH
NORTH BERWICK
BERWICK
Little River East
Little River West
Merriland River Wetlands
Webhannet River Headwaters
WELLS
Wells and Ogunquit Marsh
Rochester, NH
Beaver Dam Heath
Cranberry Meadow
Knights Pond
Somersworth, NH
OGUNQUIT
Passaconway Pond
Rollinsford, NH
Barrington, NH
Mount Agamenticus and York River Headwaters
Dover, NH
Madbury, NH
YORK
Sturgeon Creek
ELIOT
Lee, NH
Durham, NH
Brave Boat Harbor and Gerrish Island
Newington, NH
KITTERY
Newmarket, NH
Epping, NH
Portsmouth, NH
New Castle, NH
Greenland, NH
Newfields, NH
Rye, NH
Stratham, NH
Saco River
Little River
Kennebunk River
Mousam River
Great Works River
Merrimack River
Ogunquit River
Cocheco River
Salmon Falls River
Bellamy River
Oyster River
Piscataqua River
York River
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 1.25 2.5 5 Miles
0 1.25 2.5 5 Kilometers
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:200,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Piscataqua River Watershed Boundary
Town Boundaries
Highways
Interstate
State Primary
State Secondary
U.S. Primary Route
MAINE
NEW HAMPSHIRE

SECTION IV: CONSERVATION FOCUS AREA DESCRIPTIONS

This plan identifies 25 Conservation Focus Areas through a systematic, state-of-the-art analysis of a wealth of natural resources data. Collectively, these areas comprise approximately 85,642 acres designated as Core Areas and an additional 74,523 acres of supporting landscape. A map showing all 25 Conservation Focus Areas within the 18 town region covered by the plan is shown on page 24.

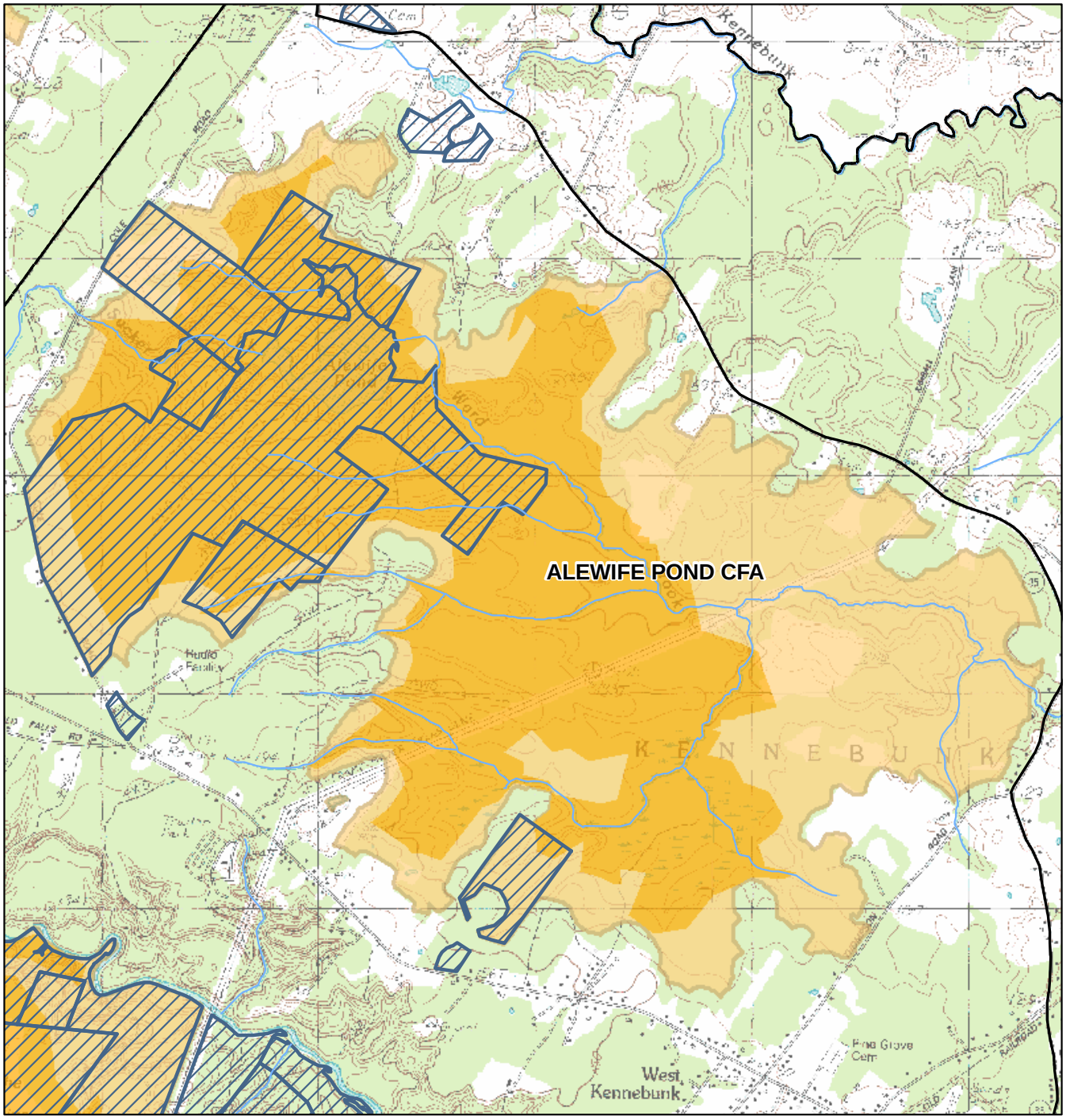
The Conservation Focus Areas (CFAs) are named as follows:

1. Alewife Pond
2. Bauneg Beg
3. Beaver Dam Heath
4. Brave Boat Harbor
5. Cranberry Meadow
6. Folsom Pond
7. Gerrish Mountain
8. Kennebunk Plains and Wells Barrens
9. Knights Pond
10. Little River East
11. Little River West
12. Massabesic Forest South
13. Merriland River Wetlands
14. Mount Agamenticus
15. Passaconway Pond
16. Sanford Ponds
17. Shaker Pond
18. Shapleigh Pond
19. South Acton Swamps
20. Sturgeon Creek
21. Walnut Hill
22. Waterboro Shapleigh Barrens
23. Webhannet River Headwaters
24. Wells and Ogunquit Marsh
25. West Sanford Swamps

This CFA description section contains the following:

- A map of the region showing the location of all 25 Conservation Focus Areas.
- A description page and map for each CFA that provides detailed information about its location, size, and significant ecological resource attributes. These CFA descriptions and maps are presented in alphabetical order based on the name given to the CFA, as shown in the list above.

Maps of CFAs tailored specifically for each of the 18 towns included in this plan are available through Beginning with Habitat or the Piscataqua Region Estuaries Partnership upon request.



Beginning with HABITAT

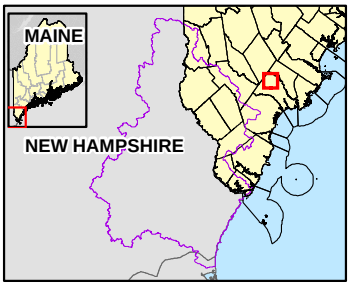
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

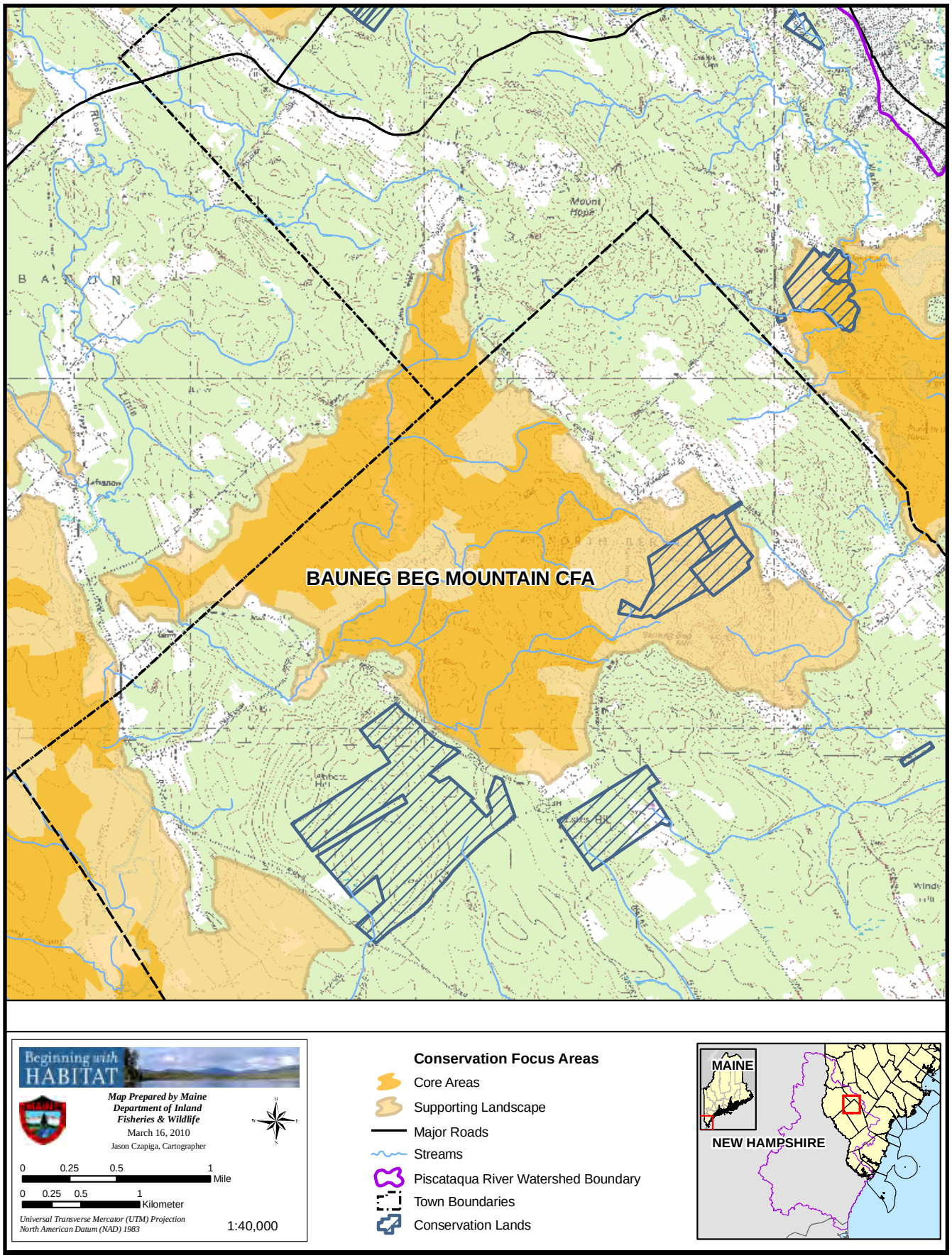
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:24,000

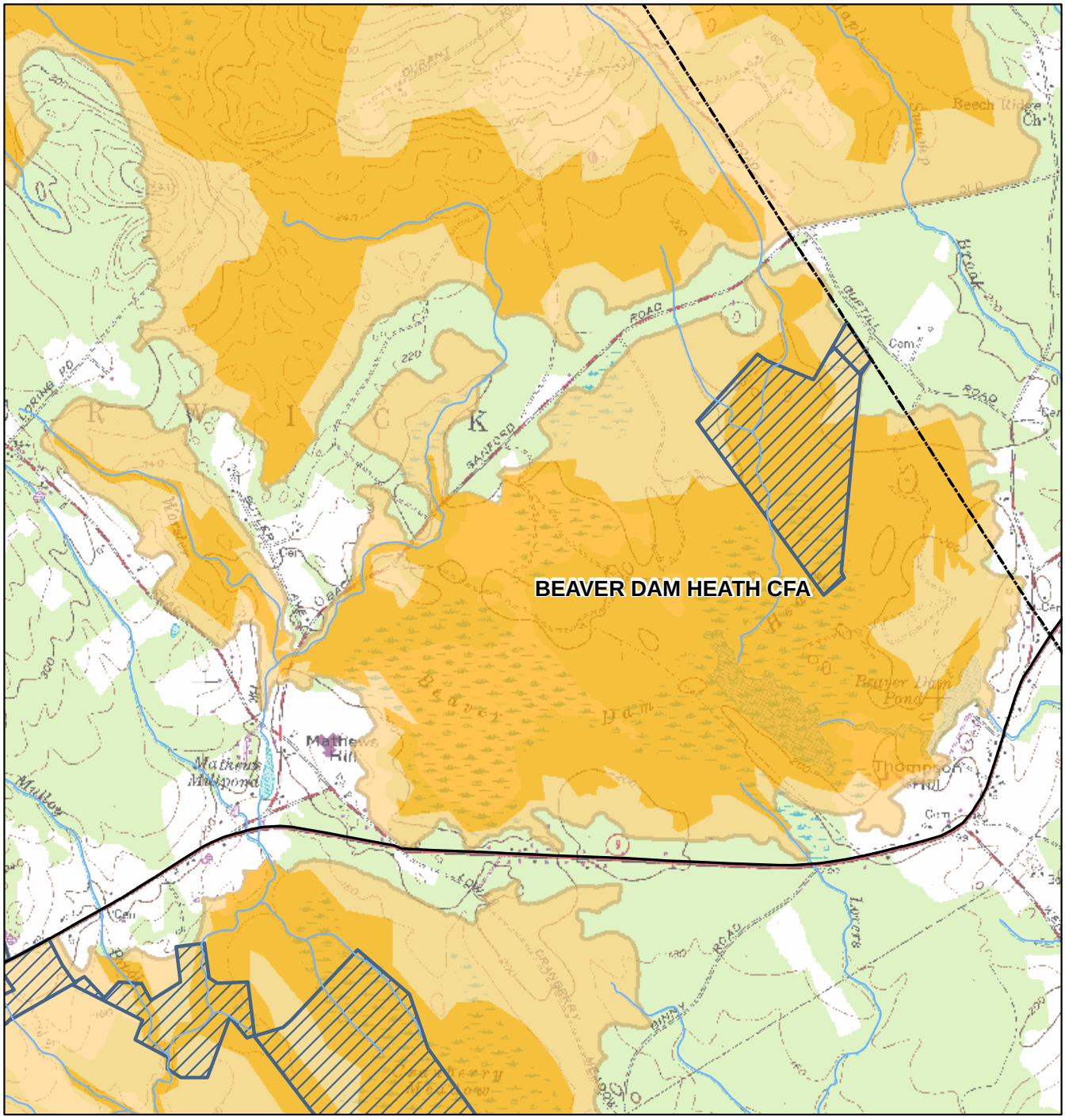
Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



ALEWIFE POND		
TOWNS: Kennebunk		
WATERSHED: Mousam River (Sucker Brook, Ward Brook)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1,245 acres	1,052 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	1,235 acres	884 acres
Area w/in unfragmented forest block	843 acres	55 acres
Freshwater Systems		
Undeveloped stream reaches	22	7
River & stream miles	7.6 miles	0.5 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	5 mapped IWWH totaling 60 acres	17 acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1 mapped DWA 109 acres in core area	42 acres extend into supporting landscape
Significant vernal pool	1 mapped SVP totaling 7 acres	
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	none identified	none identified
Rare animal populations	none identified	none identified
Rare natural communities	none identified	none identified
Exemplary natural communities and ecosystems	none identified	none identified
Water Supply		
High yield aquifer		
Significant sand and gravel aquifer	present	
Surface water intakes	n/a	
Wellheads and wellhead protection zones	n/a	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	2 parcels that include 474 acres within core	161 acres in supporting landscape
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Alewife Pond is identified as a focus area in Kennebunk's open space plan and is a priority for the Kennebunk Land Trust	


BAUNEG BEG MOUNTAIN CFA
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.25 0.5 1 Mile
0 0.25 0.5 1 Kilometer
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:40,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

BAUNEG BEG MOUNTAIN		
TOWNS: North Berwick, Lebanon, Sanford		
WATERSHED: Little River headwaters (Salmon Falls River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1,572 acres	1,216 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	1,562 acres	834 acres
Area w/in unfragmented forest block	1,278 acres	64 acres
Freshwater Systems		
Undeveloped stream reaches	30	19
River & stream miles	10 miles	1.7 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	7 mapped IWWH totaling 92 acres	14 acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1 mapped DWA 109 acres in core area	42 acres extend into supporting landscape
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Small Whorled Pogonia, Swamp Saxifrage	
Rare animal populations	Blanding's Turtle	
Rare natural communities		
Exemplary natural communities and ecosystems	Red Maple Fen	
Water Supply		
High yield aquifer	A Significant Sand and Gravel Aquifer is mapped in the western half of this CFA	
Wellheads and wellhead protection zones		
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	119 acres protected in supporting landscape.	
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Bauneg Beg Mountain is included as a focus area in Maine's Wildlife	Action Plan and is identified as a conservation priority
	GWRLT Conservation Plan	



Beginning with HABITAT

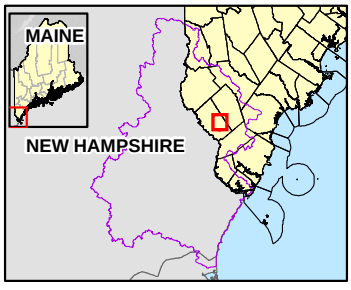
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

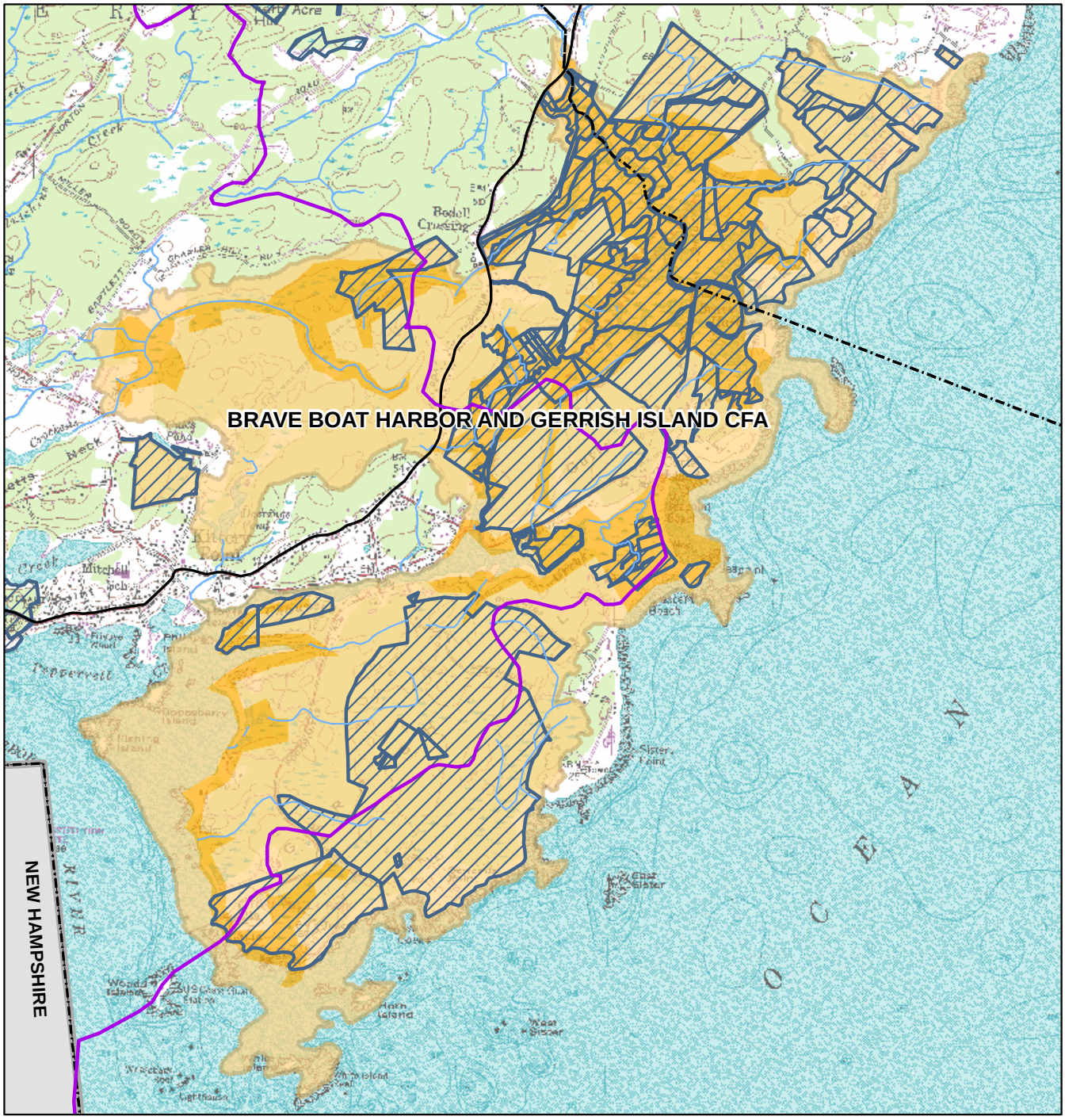
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:24,000

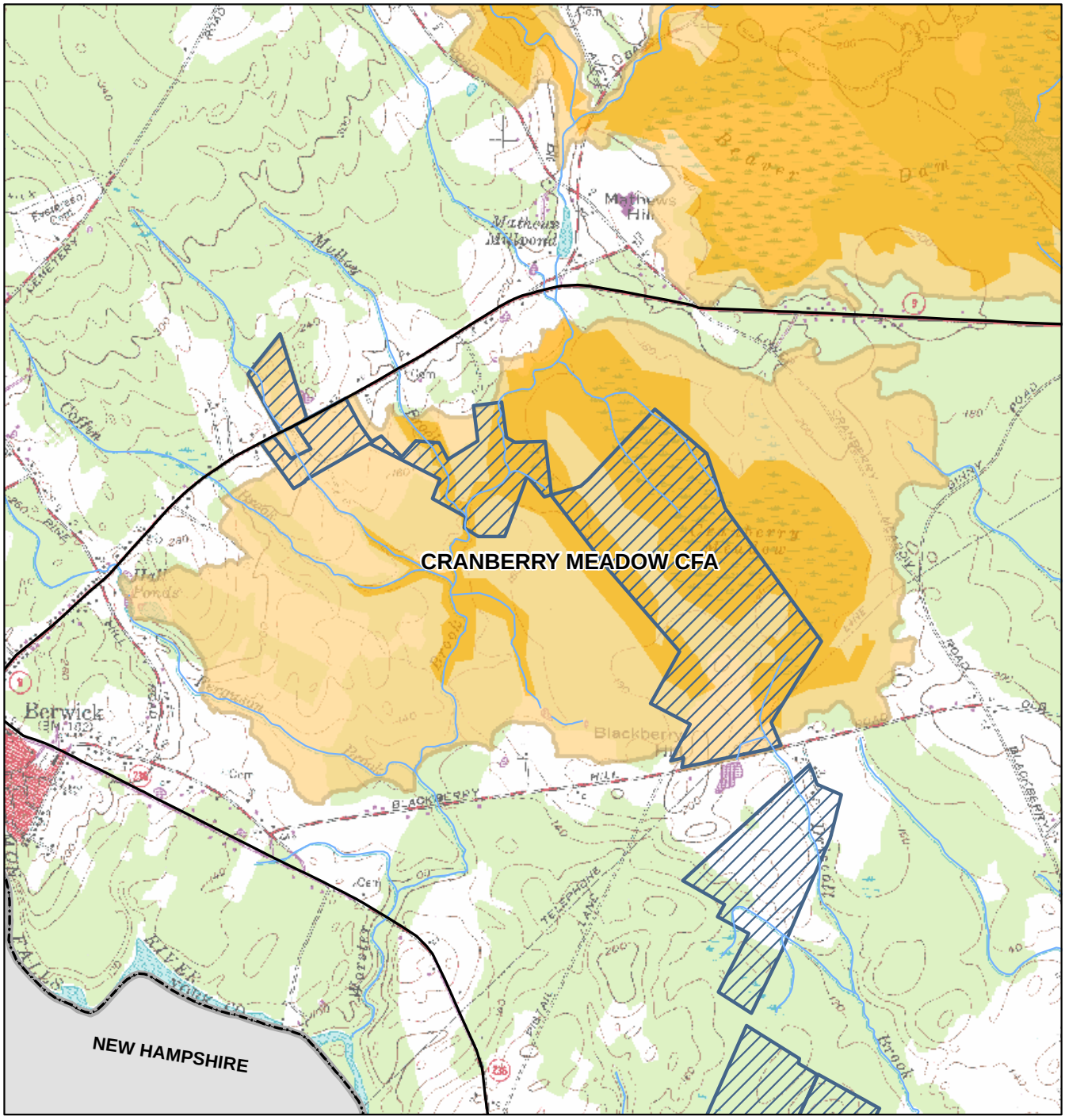
Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



BEAVER DAM HEATH		
TOWNS: Berwick, North Berwick		
WATERSHED: Beaver Dam Brook and Lovers Brook headwaters (Great Works River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1,051 acres	583 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	994 acres	323 acres
Area w/in unfragmented forest block	618 acres	69 acres
Freshwater Systems		
Undeveloped stream reaches	8	5
River & stream miles	2.5 miles	0.3 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	7 mapped IWWH totaling 289 acres	27 acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1 mapped DWA 62 acres in core area	39 acres extend into supporting landscape
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Button Sedge, Smooth Winterberry Holly, Eastern Joe-pye Weed, Atlantic White Cedar	
Rare animal populations	Blanding's Turtle, Spotted Turtle, Black Racer	
Rare natural communities	Atlantic White Cedar Swamp	
Exemplary natural communities and ecosystems		
Water Supply		
High yield aquifer	Most of this CFA is underlain by a Significant sand and gravel aquifer	
Wellheads and wellhead protection zones		
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	103 acres within core	21 acres in supporting landscape
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Beaver Dam Heath is included as a focus area in Maine's Wildlife	
	Action Plan and is identified as a conservation priority	
	GWRLT Conservation Plan	


BRAVE BOAT HARBOR AND GERRISH ISLAND CFA
NEW HAMPSHIRE
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.25 0.5 1 Mile
0 0.25 0.5 1 Kilometer
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:30,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

BRAVEBOAT HARBOR AND GERRISH ISLAND		
TOWNS: Kittery, York		
WATERSHED: Braveboat Harbor, Chauncey Creek		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	874 acres	2,449 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	528 acres	1,029 acres
Area w/in unfragmented forest block	n/a	n/a
Freshwater Systems		
Undeveloped stream reaches	47	17
River & stream miles	4.5 miles	2 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	2 mapped IWWH totaling 28 acres	5 mapped IWWH totaling 37 acres
Tidal wadingbird waterfowl habitat	9 mapped IWWH totaling 439 acres	13 mapped IWWH totaling 296 acres
Deer wintering area	1 mapped DWA 24 acres in core area	2 mapped DWA 398 acres in supporting landscape
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	1 mapped shorebird roost totaling 17 acres	2 acres of roost habitat extend into supporting landscape
Significant Plant & Animal Occurrences		
Rare plant populations	American Sea Blite, Dwarf Glasswort, Mountain Laurel, Saltmarsh False Foxglove, Scarlet Oak, Spicebush, Spotted Wintergreen, Wild Coffee, Wild Garlic	
Rare animal populations	Harlequin Duck, Ribbon Snake, Saltmarsh Sharp-tailed Sparrow, Spotted Turtle	
Rare natural communities	Dune Grassland, Red Oak-White Oak Forest	
Exemplary natural communities and ecosystems	Coastal Dune - Marsh Ecosystem	
Water Supply		
High yield aquifer	none mapped	
Wellheads and wellhead protection zones		
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	877 acres (more acres are conserved than noted for area above)	1238 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Brave Boat Harbor is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority	
	MtA2C Conservation Plan	
	Most of this area is designated as Rural Conservation in the Town of Kittery's land use ordinance	



Beginning with HABITAT

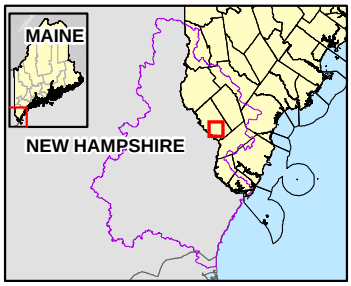
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

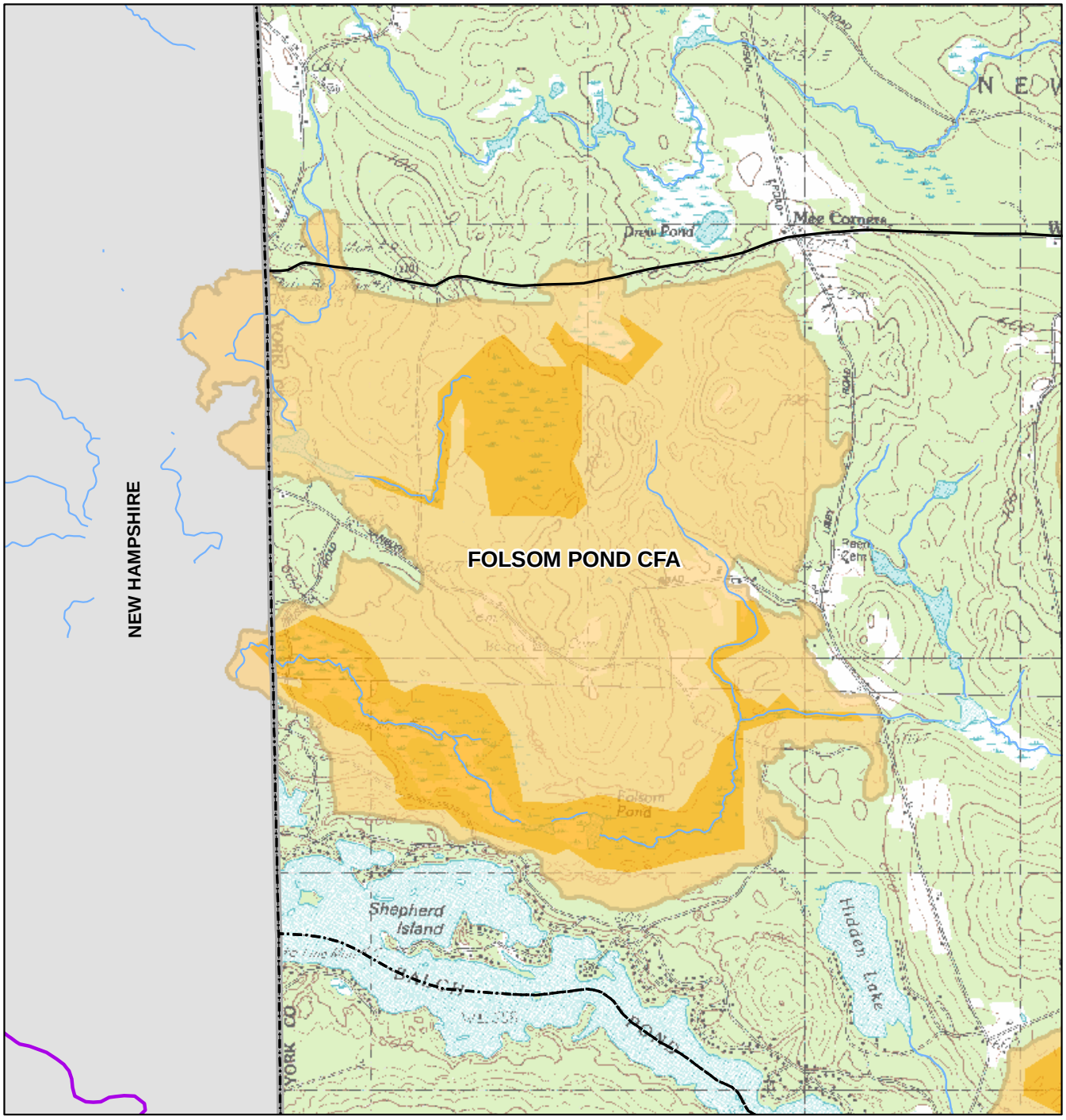
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:24,000

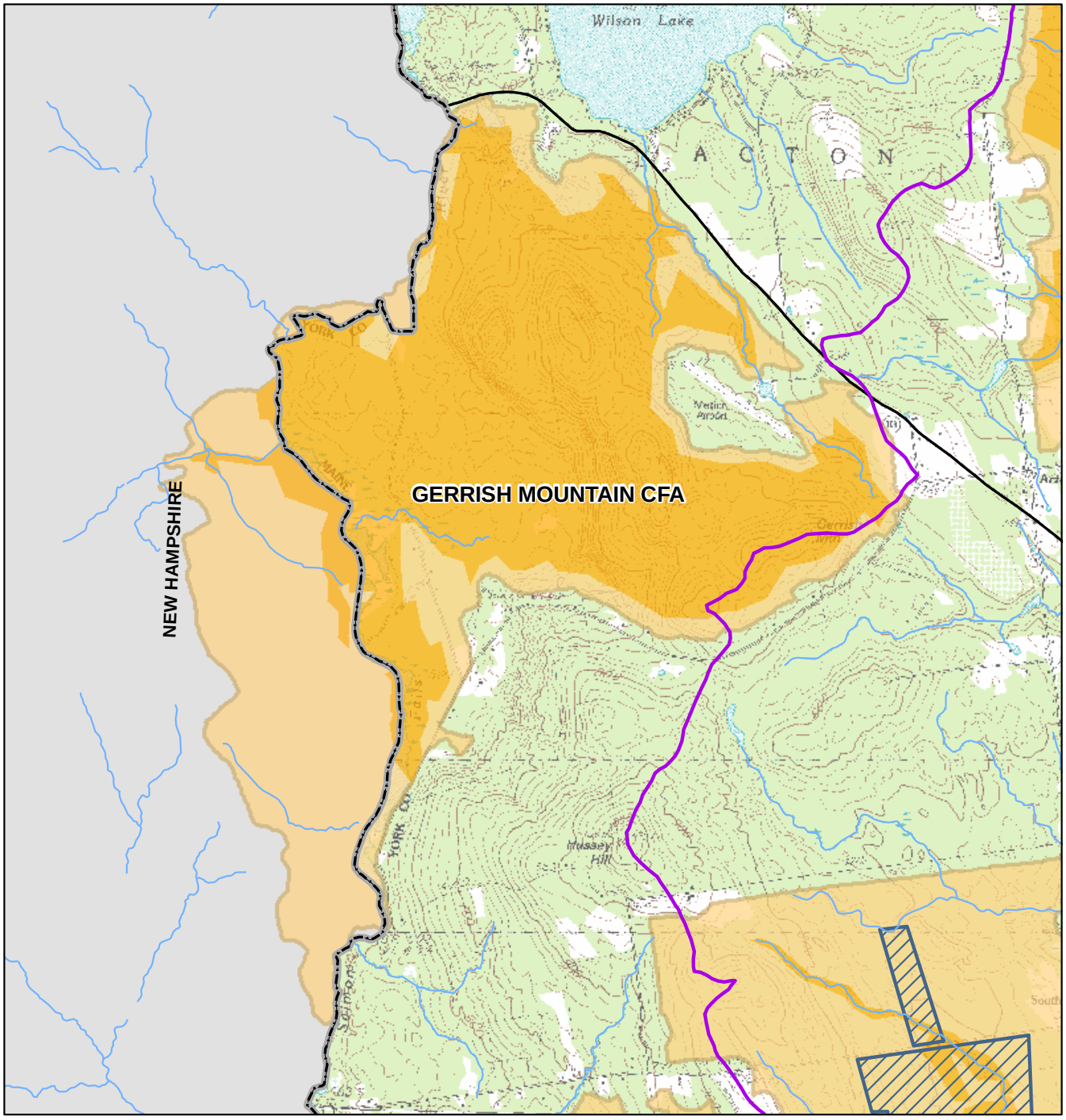
Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



CRANBERRY MEADOW		
TOWNS: Berwick		
WATERSHED: Driscoll Brook Headwaters (Salmon Falls River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	427 acres	954 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	423 acres	778 acres
Area w/in unfragmented forest block	350 acres	317 acres
Freshwater Systems		
Undeveloped stream reaches	16	9
River & stream miles	4 miles	1.6 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	none mapped	1 acre within supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1 mapped DWA 106 acres in core area	113 acres extend into supporting landscape
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	none mapped	
Rare animal populations	none mapped	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	none mapped	
Wellheads and wellhead protection zones	Two public water supply wells occur in the northeastern portion of this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	333 acres	350 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives		


FOLSOM POND CFA
NEW HAMPSHIRE
YORK CO.
Drew Pond
Folsom Pond
Shepherd Island
Hidden Lake
Mac Corners
Beech Cem.
Beech Ridge Road
Folsom Pond Road
Shepherd Island Road
Hidden Lake Road
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:24,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

FOLSOM POND		
TOWNS: Newfield		
WATERSHED: Little Ossipee River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	365 acres	1238 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	342 acres	1000 acres
Area w/in unfragmented forest block	111 acres	453 acres
Freshwater Systems		
Undeveloped stream reaches	13	7
River & stream miles	3 miles	1.1 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	4 mapped totaling 154 acres	21 acres within supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations		
Rare animal populations	Barrens Chaetglaea, Broad Sallow, Similar Underwing	
Rare natural communities	Pitch Pine Bog, Tall Sedge Fen	
Exemplary natural communities and ecosystems		
Water Supply		
High yield aquifer	Much of this CFA is underlain by a Significant sand and gravel aquifer	
Wellheads and wellhead protection zones		
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	0 acres	0 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Folsom Pond is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority	



Beginning with HABITAT

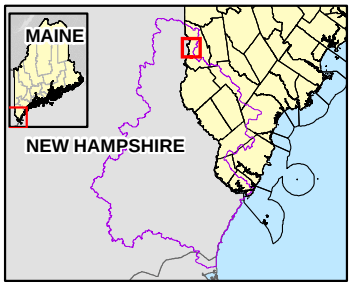
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.25 0.5 1 Mile
0 0.25 0.5 1 Kilometer

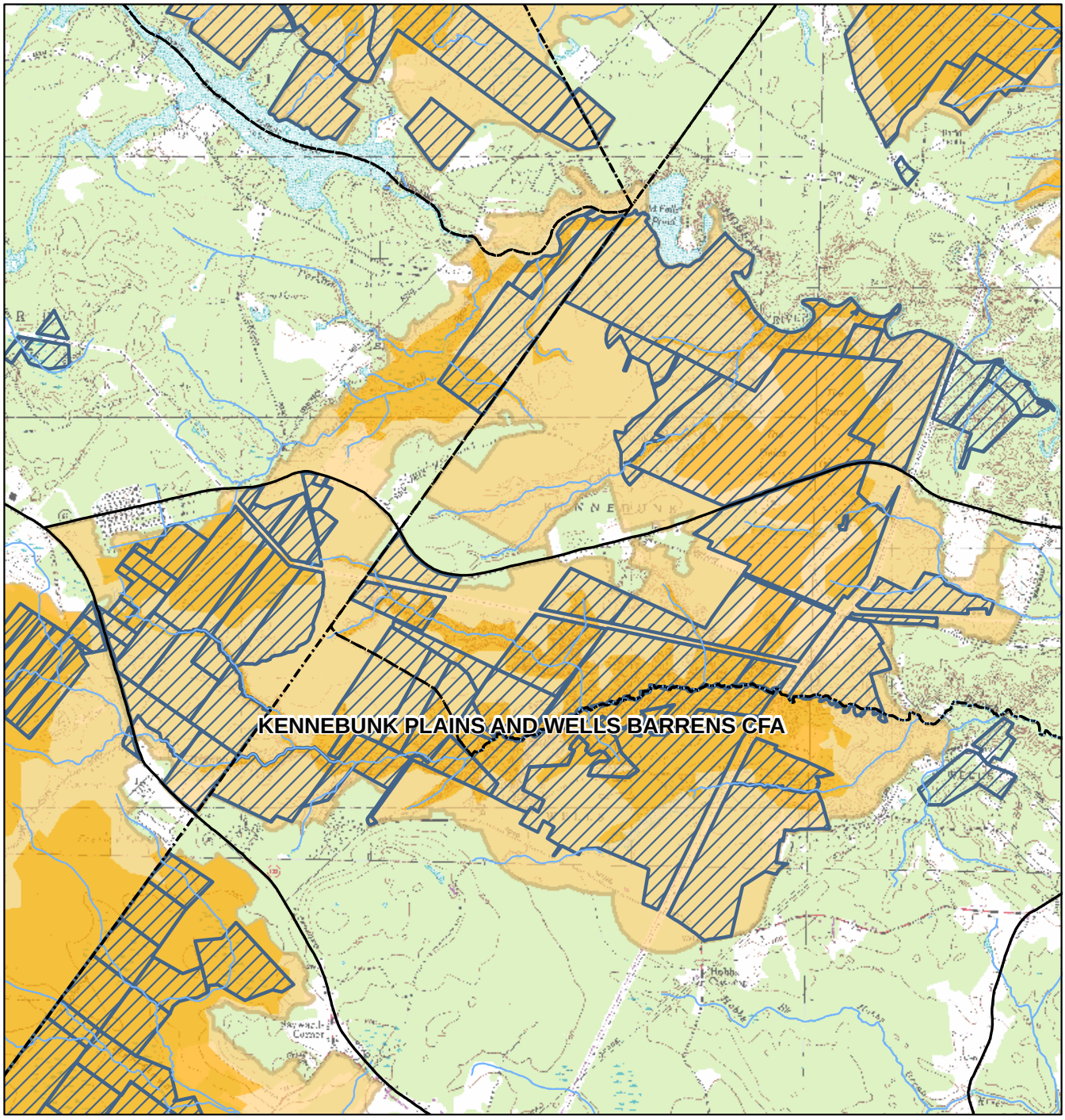
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:30,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



GERRISH MOUNTAIN		
TOWNS: Acton		
WATERSHED: Wilson Lake and Salmon Falls River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1312 acres	1018 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	1226 acres	288 acres
Area w/in unfragmented forest block	1056 acres	14 acres
Freshwater Systems		
Undeveloped stream reaches	11	5
River & stream miles	2.2 miles	.25 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	1 mapped totaling 89 acres	24 additional acres within supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	none mapped	
Rare animal populations	none mapped	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	One south of Wilson Lake and one straddling Flat Ground Road	
Wellheads and wellhead protection zones		
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	0 acres	0 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives		



Beginning with HABITAT

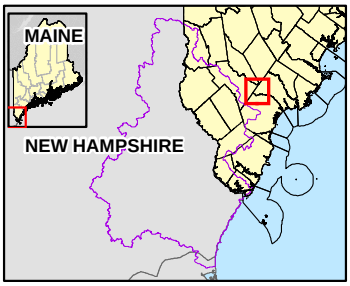
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.25 0.5 1 Mile
0 0.25 0.5 1 Kilometer

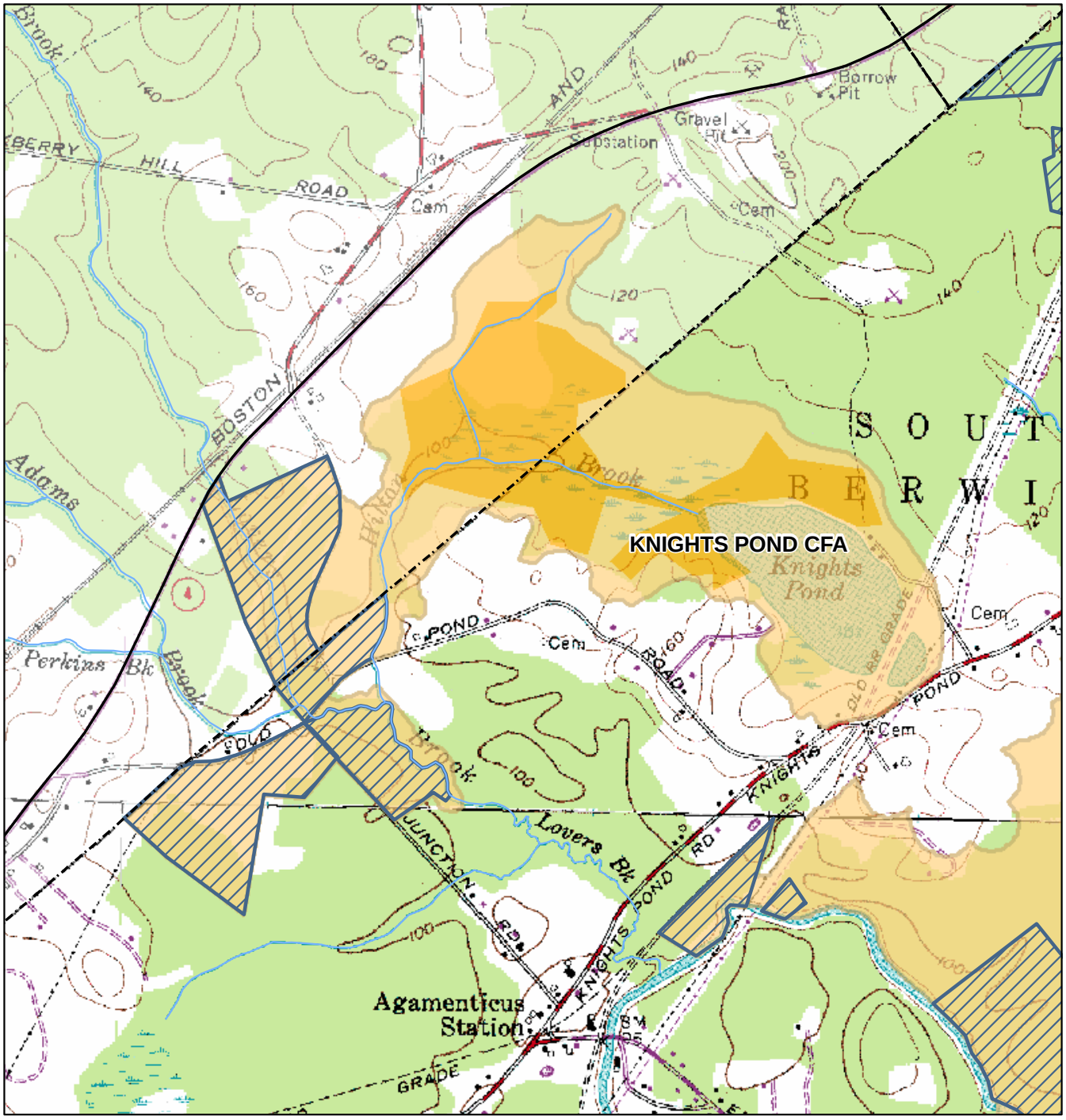
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:40,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



KENNEBUNK PLAINS AND WELLS BARRENS		
TOWNS: Kennebunk, Wells, Sanford, Alfred, Lyman		
WATERSHED: Mousam River, Branch Brook, Day Brook		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1767 acres	4028 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	1534 acres	2512 acres
Area w/in unfragmented forest block	200 acres	489 acres
Freshwater Systems		
Undeveloped stream reaches	47	36
River & stream miles	13.5 miles	3.5 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	5 mapped totaling 26 acres	22 additional acres within supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	1 mapped	2 mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Small Reed-grass, Upright Bindweed, Northern Blazing Star, Pale Green Orchis, White-topped Aster, Hairy Bonset, Button Sedge	
Rare animal populations	Grasshopper Sparrow, Upland Sandpiper, Northern Black Racer, Ribbon Snake, Box Turtle, Wood Turtle, Spotted Turtle, Barrens Chaetaglaea, Broad Sallow	
Rare natural communities	Sandplain Grassland, Pitch Pine - Scrub Oak Barren	
Exemplary natural communities and ecosystems	Red Maple Swamp	
Water Supply		
High yield aquifer	Large areas of sand and gravel aquifer mapped	
Wellheads and wellhead protection zones	One public water supply well mapped within CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	2,429 acres	3,953 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The Kennebunk Plains and Wells Barrens area is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority GWRLT Conservation Plan Both the Kennebunk and Sanford Conservation Plans identify this area as a priority for conservation	



Beginning with HABITAT

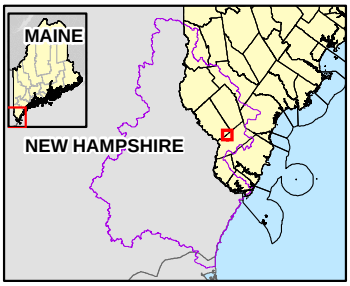
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.125 0.25 0.5 Mile
0 0.125 0.25 0.5 Kilometer

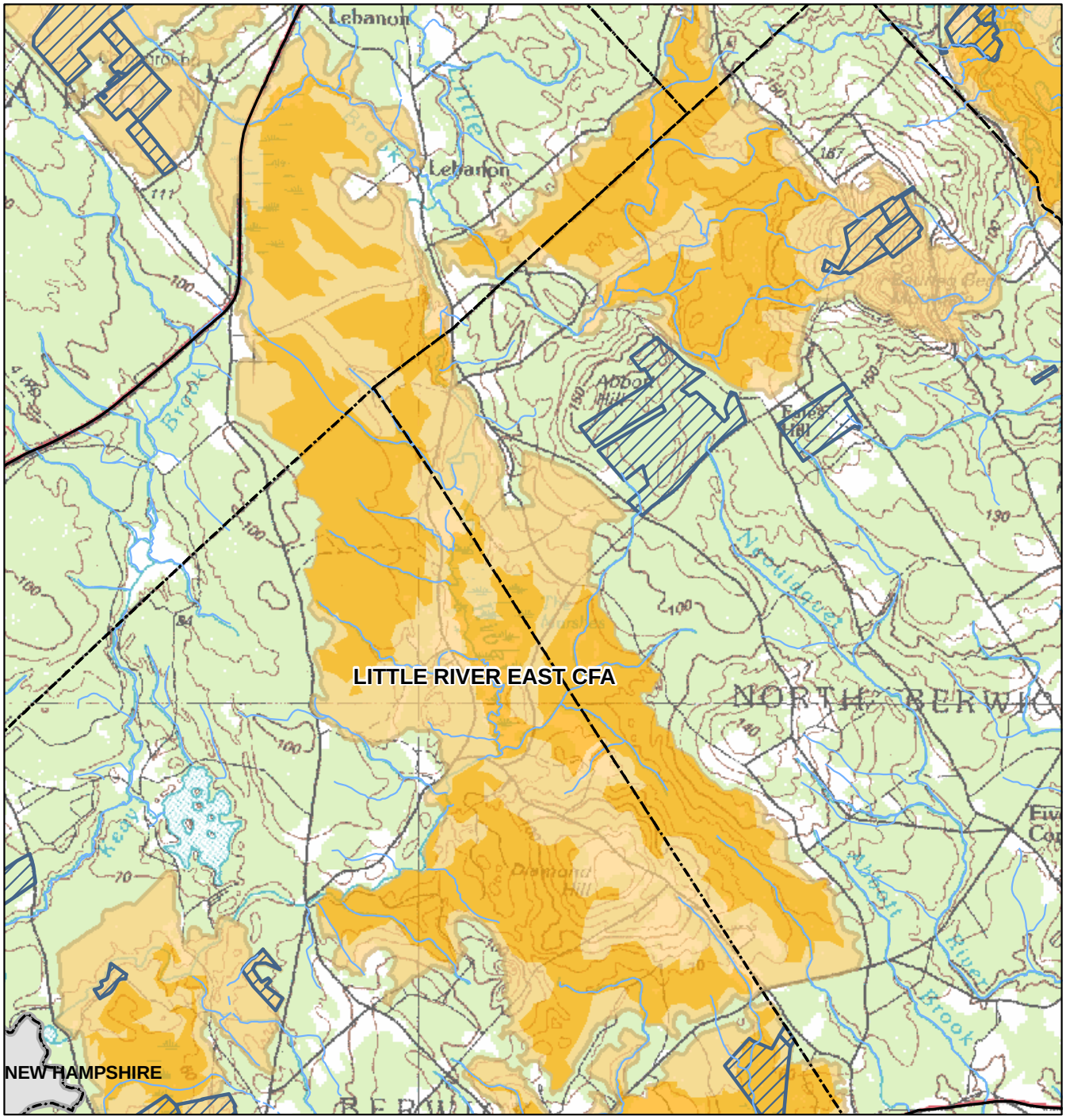
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:16,000

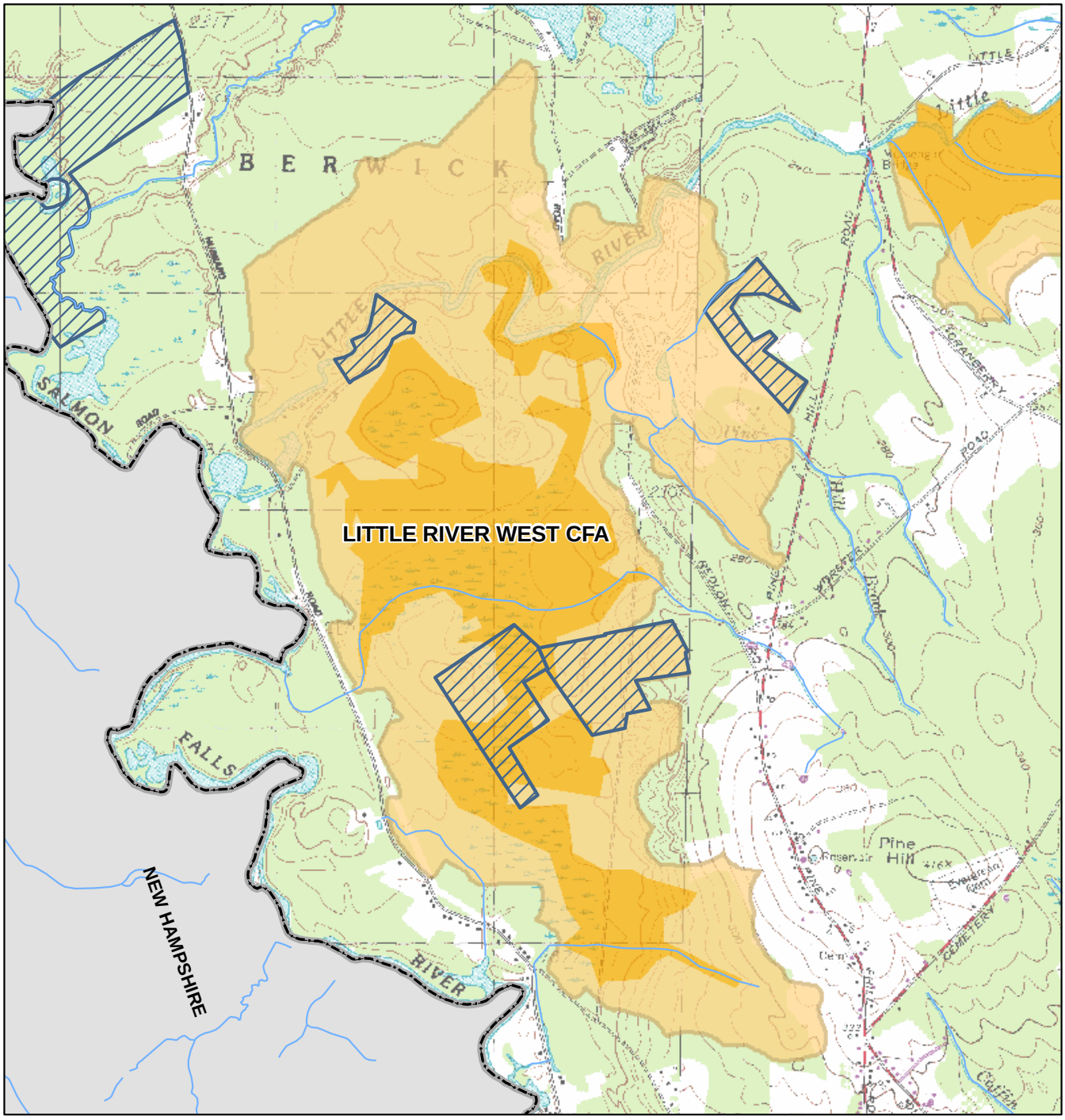
Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



KNIGHTS POND		
TOWNS: Berwick, South Berwick		
WATERSHED: Hilto Brook, Lover's Brook, Great Works River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	114 acres	337 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	111 acres	150 acres
Area w/in unfragmented forest block	n/a	n/a
Freshwater Systems		
Undeveloped stream reaches	3	2
River & stream miles	1 mile	0.4 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	3 mapped totaling 35 acres	57 additional acres within **SUPPORTING LANDSCAPE**
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Swamp Saxifrage	
Rare animal populations	Spotted Turtle	
Rare natural communities		
Exemplary natural communities and ecosystems		
Water Supply		
High yield aquifer	Mapped sand a water aquifer at northern edge of CFA	
Wellheads and wellhead protection zones	One public water supply well mapped along southern edge of CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	0 acres	111 acres (correct figure?)
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives		


Lebanon
Lebanon
LITTLE RIVER EAST CFA
NEW HAMPSHIRE
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:60,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

LITTLE RIVER EAST		
TOWNS: Berwick, North Berwick, Lebanon		
WATERSHED: Little River (Salmon Falls River), Maple Swamp Brook (Great Works River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	4,372 acres	4,191 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	4,252 acres	2,327 acres
Area w/in unfragmented forest block	3,219 acres	411 acres
Freshwater Systems		
Undeveloped stream reaches	38	27
River & stream miles	14 miles	3 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	17 mapped totaling 628 acres	53 additional acres within **SUPPORTING LANDSCAPE**
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	635 acres	360 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	none mapped	
Rare animal populations	Northern Black Racer, Spotted Turtle, Wood Turtle	
Rare natural communities		
Exemplary natural communities and ecosystems	Appalachian - Acadian Basin Swamp Ecosystem	
Water Supply		
High yield aquifer	Portions of the “marshes” are mapped as underlain by sand and gravel aquifers	
Wellheads and wellhead protection zones	none mapped	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	0 acres	111 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	GWRLT Conservation Plan	



Beginning with HABITAT

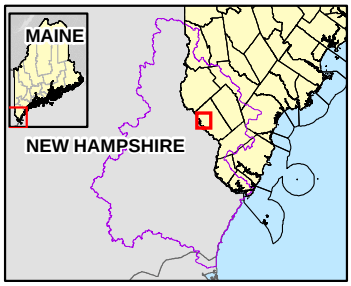
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

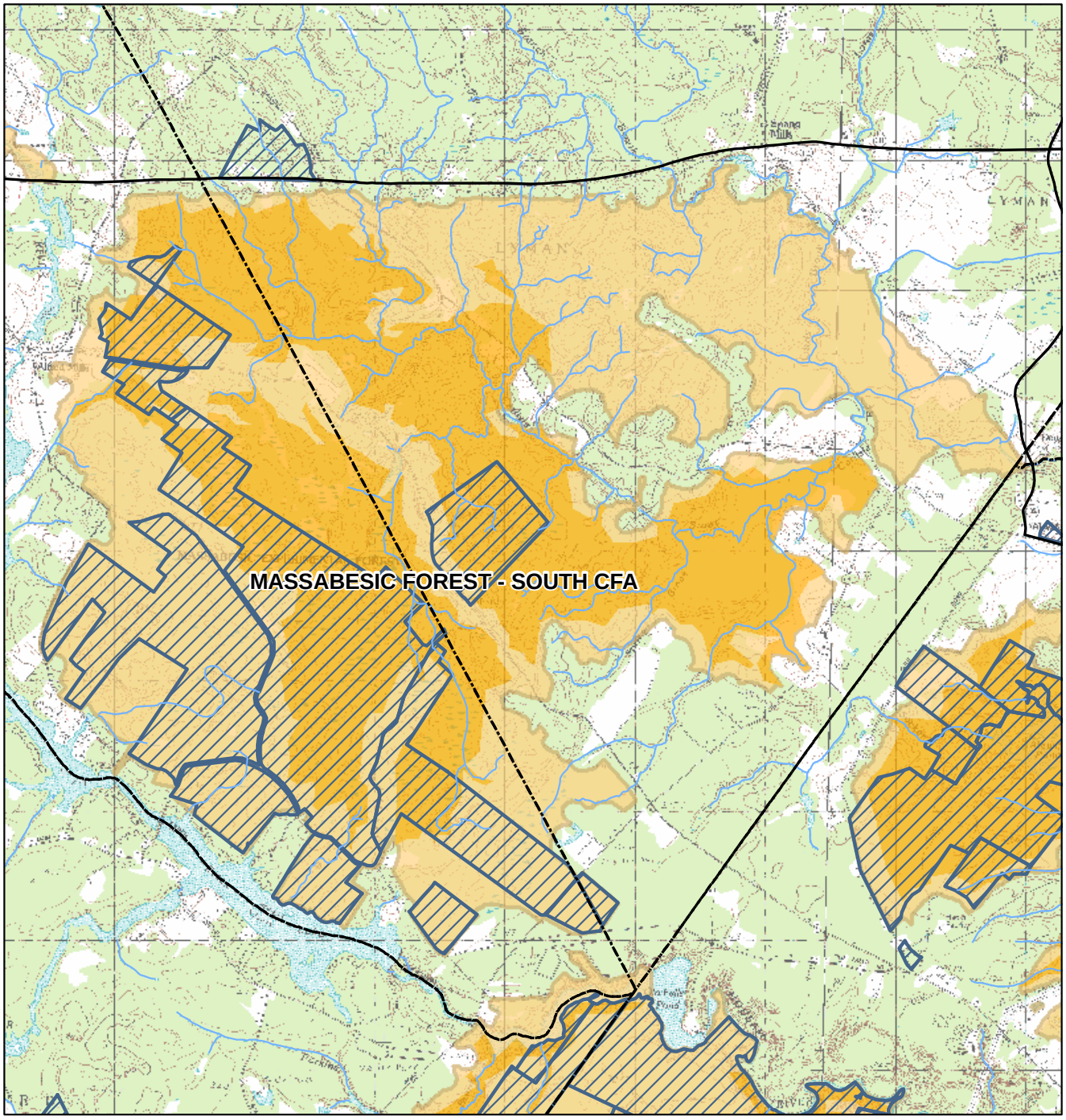
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:24,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



LITTLE RIVER WEST		
TOWNS: Berwick		
WATERSHED: Little River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	477 acres	1,144 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	473 acres	887 acres
Area w/in unfragmented forest block	419 acres	261 acres
Freshwater Systems		
Undeveloped stream reaches	4	10
River & stream miles	1.7 miles	1.2 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	2 mapped totaling 15 acres in core habitat	5 additional acres within supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	148 acres	278 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Spicebush	
Rare animal populations	Spotted Turtle, Upland Sandpiper	
Rare natural communities		
Exemplary natural communities and ecosystems		
Water Supply		
High yield aquifer	Sand and gravel aquifers occur in both the eastern and western portions of this CFA	
Wellheads and wellhead protection zones	none mapped	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	33 acres	0 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	GWRLT Conservation Plan	



Beginning with HABITAT

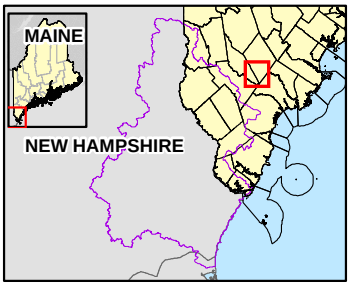
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.25 0.5 1 Mile
0 0.25 0.5 1 Kilometer

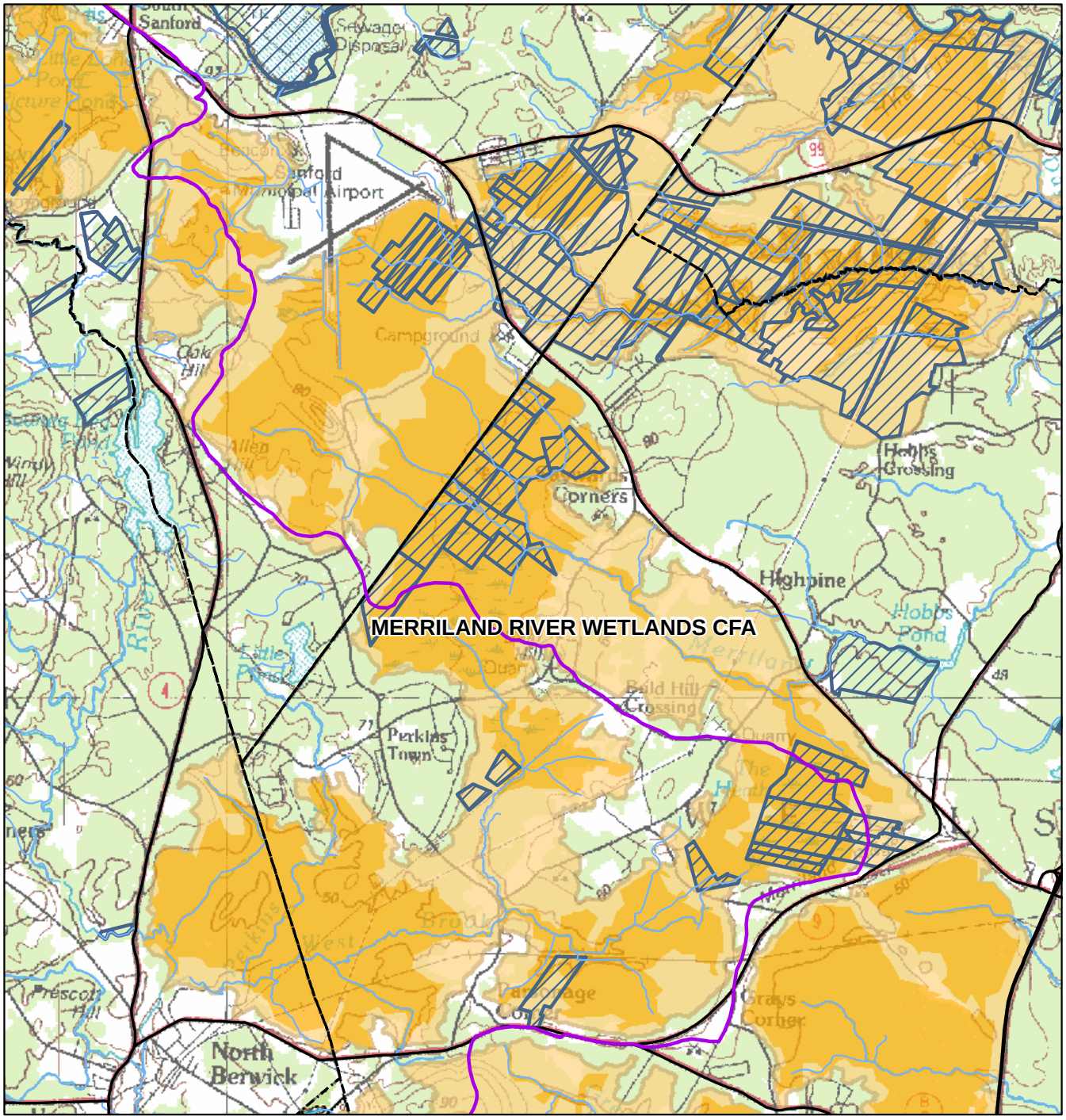
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:40,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



MASSABESIC FOREST SOUTH		
TOWNS: Alfred, Lyman		
WATERSHED: Carlisle Brook (Kennebunk River), Estes Lake (Mousam River)		
	CORE AREA	**SUPPORTING LANDSCAPE**
SIZE	2,586 acres	3,756 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	2,406 acres	2,796 acres
Area w/in unfragmented forest block	1,726 acres	702 acres
Freshwater Systems		
Undeveloped stream reaches	95	42
River & stream miles	17 miles	6 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	9 mapped totaling 98 acres	7 additional acres within **SUPPORTING LANDSCAPE**
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1,048 acres	272 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Smooth Winterberry Holly, Swamp Saxifrage, Spotted Wintergreen, Atlantic White Cedar, Columbia Water-meal	
Rare animal populations	Hessel's Hairstreak, Ringed Boghaunter, Spotted Turtle, Blanding's Turtle, Wood Turtle	
Rare natural communities	Atlantic White Cedar Swamp	
Exemplary natural communities and ecosystems	Wading Bird Rookery	
Water Supply		
High yield aquifer	Mapped sand and gravel aquifer occurs in the southern portion of this CFA	
Wellheads and wellhead protection zones	none mapped	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	1,584 acres	2,318 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The Massabesic Forest South area is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority	



Beginning with HABITAT

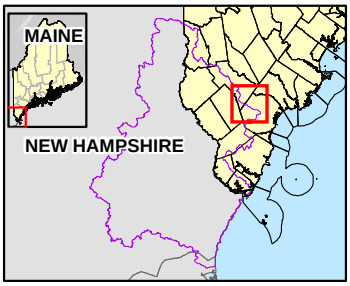
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.5 1 2 Miles
0 0.5 1 2 Kilometers

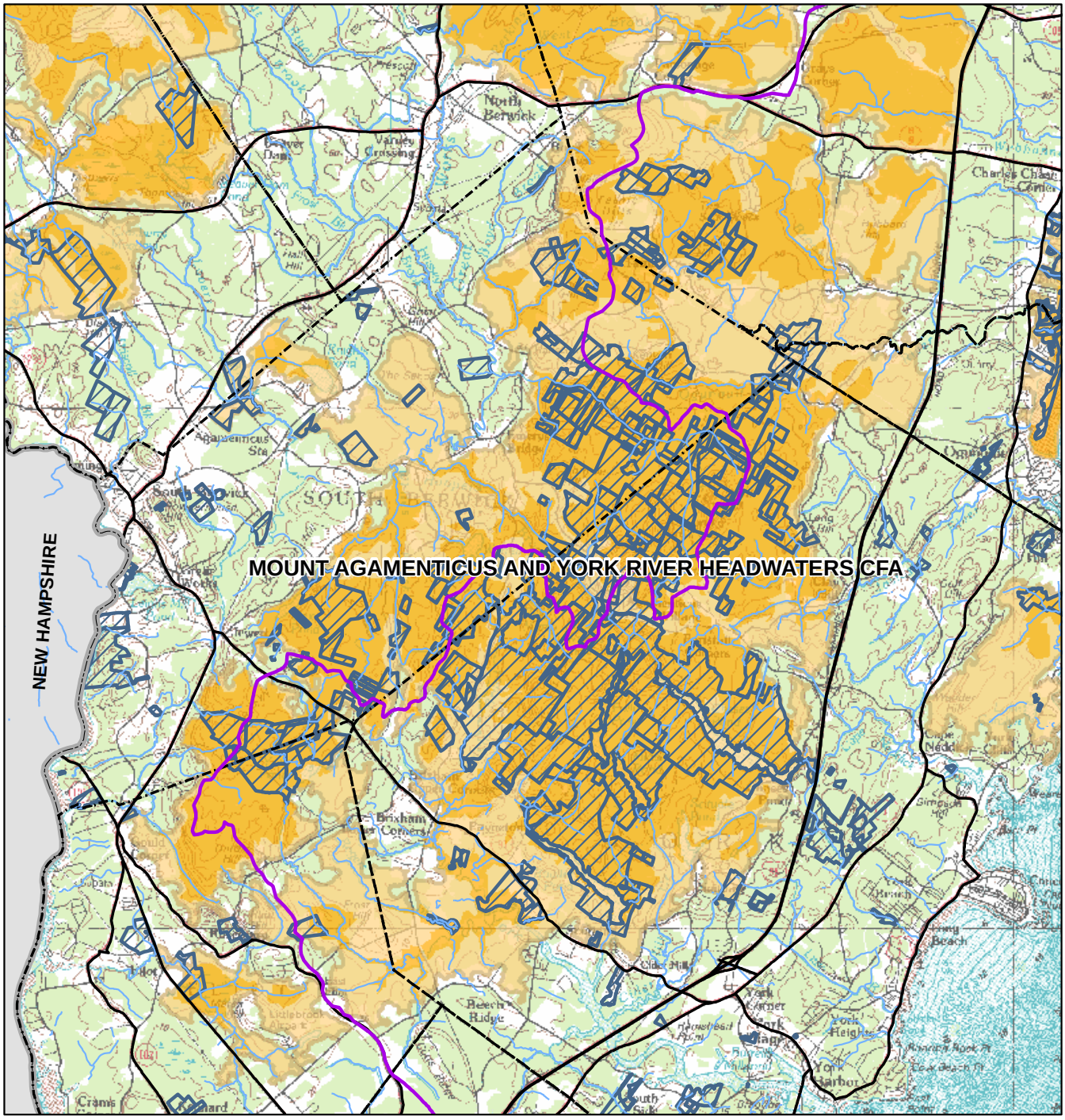
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:60,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



MERRILAND RIVER WETLANDS		
TOWNS: Wells, Sanford, North Berwick		
WATERSHED: Merriland River, Branch Brook		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	6,171 acres	4,560 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	6,067 acres	3,119 acres
Area w/in unfragmented forest block	3,812 acres	190 acres
Freshwater Systems		
Undeveloped stream reaches	93	30
River & stream miles	32 miles	2.5 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	20 mapped totaling 550 acres	4 additional IWWH mapped and 25 additional acres within supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1,291 acres	145 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Button Sedge, Small Reed Grass, Smooth Winterberry Holly, Atlantic White Cedar, Sassafras, Mountain Laurel, Sweet Pepperbush	
Rare animal populations	Spotted Turtle, Blanding's Turtle, New England Cottontail	
Rare natural communities	Pitch Pine Heath Barren, Atlantic White Cedar Swamp	
Exemplary natural communities and ecosystems	Red Maple Swamp, Raised Level Bog Ecosystem	
Water Supply		
High yield aquifer	Much of this CFA is underlain by Significant sand and gravel aquifers	
Wellheads and wellhead protection zones	Public Water Supply wells are present in this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	1,117 acres	194 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The northern section of the Merriland River Wetlands CFA is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority Sanford includes portions of this CFA as a Priority Open Space area in The Sanford Conservation Plan. GWRLT Conservation Plan	



Beginning with HABITAT

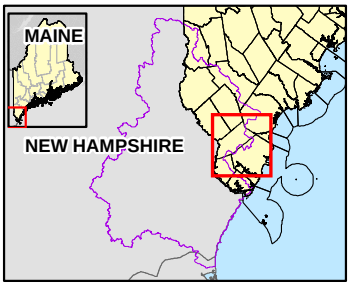
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.5 1 2 Miles
0 0.5 1 2 Kilometers

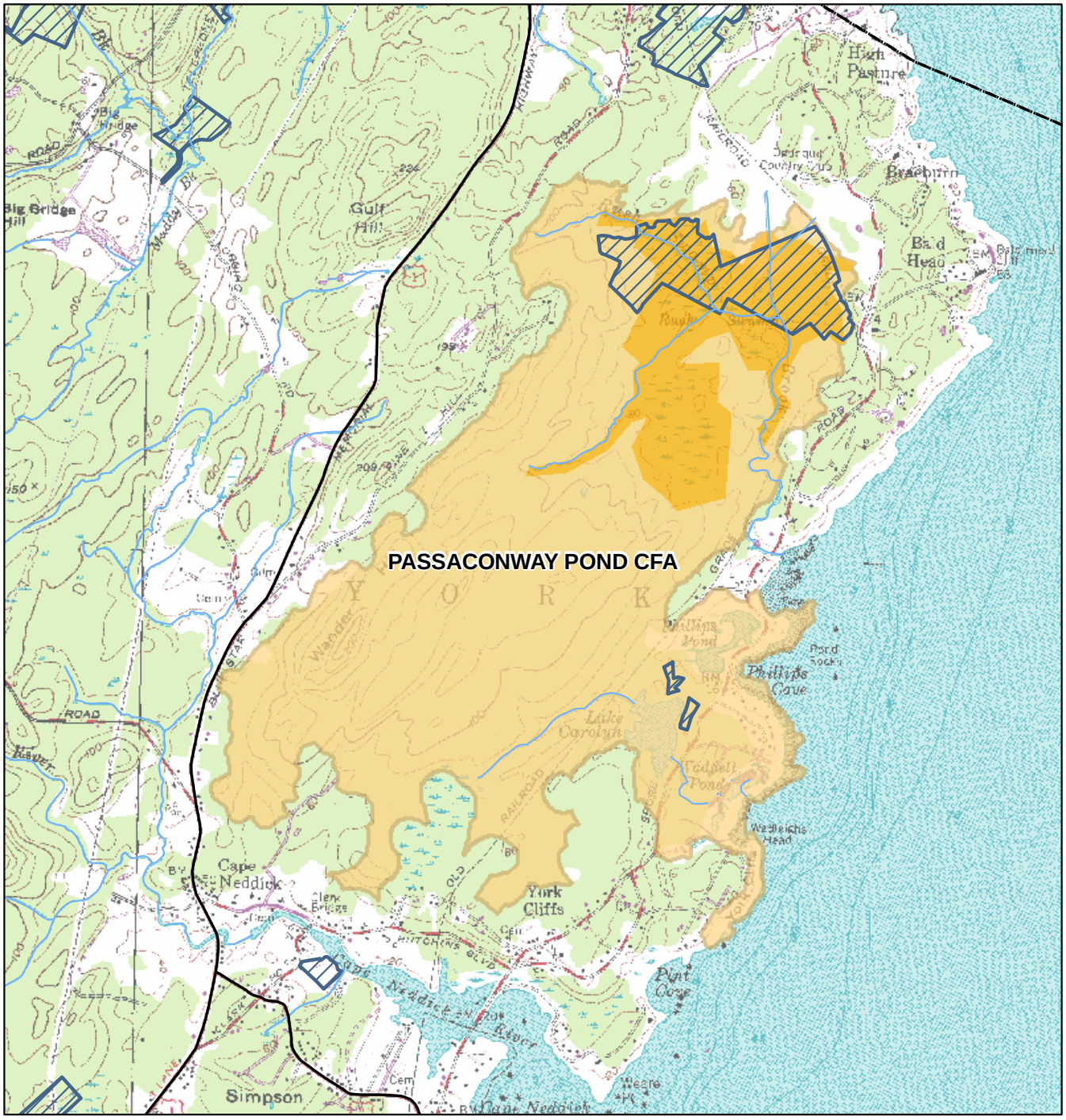
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:100,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



MOUNT AGAMENTICUS AND YORK RIVER HEADWATERS		
TOWNS: York, South Berwick, Eliot, Wells, Ogunquit		
WATERSHED: Green Brook (Ogunquit River), Bennett Brook, Marsh Brook (Great Works River), Cider Hill Creek, Smelt Brook (York River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	19,797 acres	15,000 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	18,457 acres	9,929 acres
Area w/in unfragmented forest block	14,692 acres	1,895 acres
Freshwater Systems		
Undeveloped stream reaches	342	134
River & stream miles	80 miles	18.5 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	44 mapped totaling 834 acres	12 additional IWWH mapped and 282 additional acres within supporting landscape
Tidal wadingbird waterfowl habitat	16 mapped totaling 328 acres	1 additional TWWH mapped totaling 13 additional acres in supporting landscape
Deer wintering area	1,291 acres	145 acres
Significant vernal pool	1 mapped	none mapped
Shorebird feeding / roosting area	none mapped	none mapped
Significant Plant & Animal Occurrences		
Rare plant populations	Wild Leek, White Wood Aster, Upright Bindweed, Atlantic White-cedar, Spotted Wintergreen, Sweet Pepperbush, Flowering Dogwood, Eastern Joe-pye Weed, Featherfoil, Smooth Winterberry Holly, Slender Blue Flag, Mountain Laurel, Spicebush, Broadbeech Fern, Pale Green Orchis, Alga-like Pondweed, Chestnut Oak, Tall Beak-rush, Sassafras, Swamp Saxifrage, Columbia Water-meal	
Rare animal populations	Spotted Turtle, Wood Turtle, Blanding's Turtle, Northern Black Racer, Ribbon Snake, Swamp Darter, Brown Snake, New England Cottontail, Spring Salamander, Scarlet Bluet, New England Bluet, Ringed Boghaunter	
Rare natural communities	Atlantic White Cedar Swamp, Chestnut Oak Woodland, Hemlock-Hardwood Pocket Swamp, Pitch Pine Bog, White Oak - Red Oak Forest	
Exemplary natural communities and ecosystems	Leatherleaf Boggy Fen, Mixed Graminoid-Shrub Marsh, Pipewort-Water Lobelia Aquatic Bed, Red Maple-Sensitive Fern Swamp	
Water Supply		
High yield aquifer	A significant sand and gravel aquifer is mapped in the supporting landscape east of Knights Pond	
Wellheads and wellhead protection zones	Several public water supply wells are present in this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	11,766 acres	2,678 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The Mount Agamenticus region is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority GWRLT Conservation Plan This area is the focus of the MtA2C conservation initiative and is highlighted as a conservation priority in several town comprehensive plans	



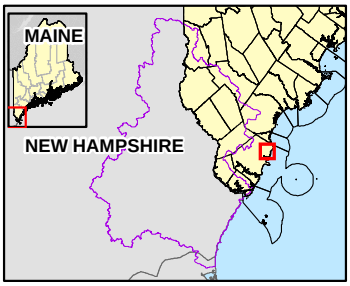
Beginning with HABITAT

Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

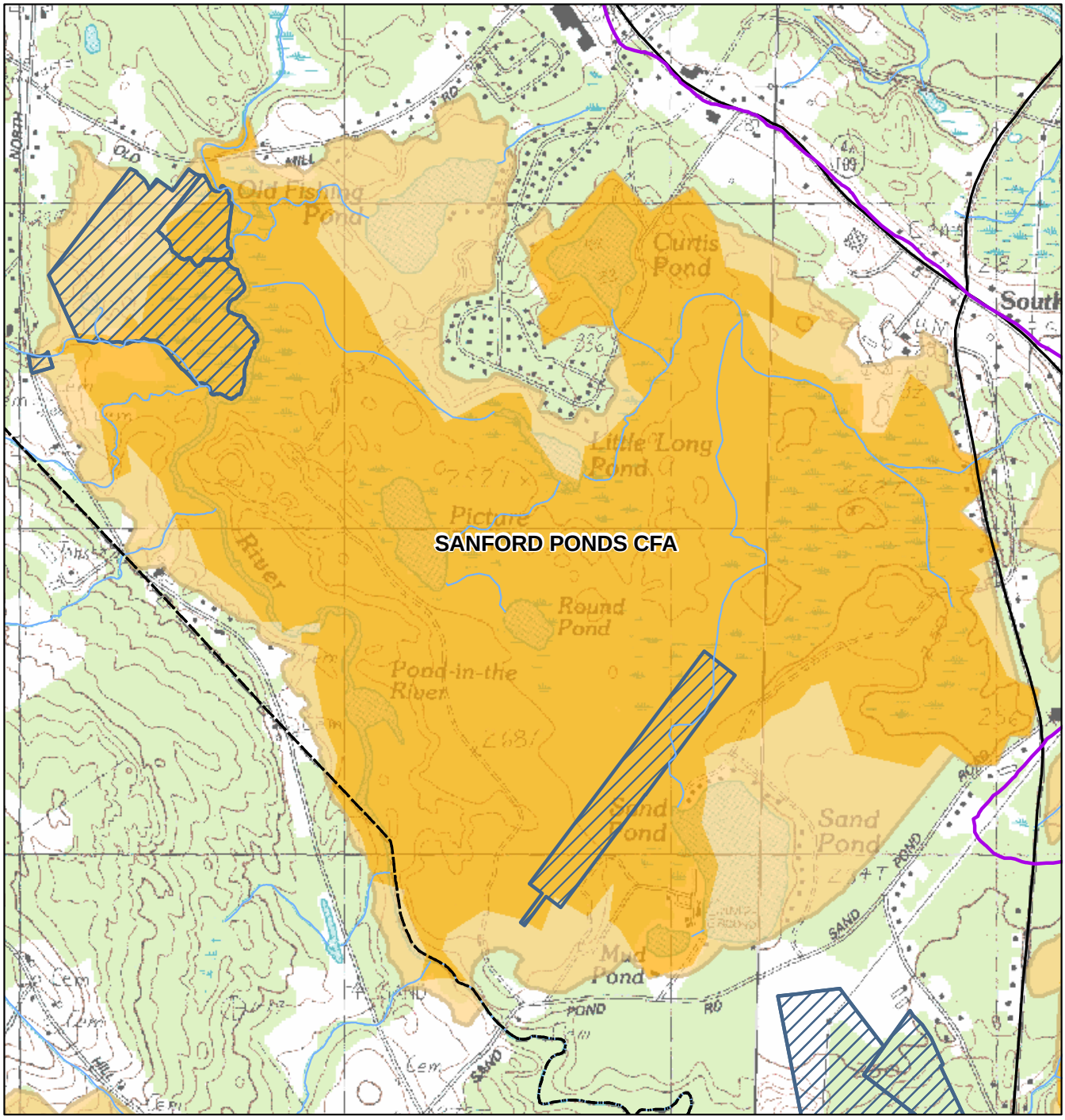
0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:24,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



PASSACONWAY POND		
TOWNS: York		
WATERSHED: Rush Swamp Brook, Cape Neddick River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	201 acres	1,104 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	199 acres	853 acres
Area w/in unfragmented forest block	157 acres	556 acres
Freshwater Systems		
Undeveloped stream reaches	7	5
River & stream miles	2 miles	1 mile
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	none mapped	3 mapped totaling 37 acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	none mapped	
Rare animal populations	Harlequin Duck, Spotted Turtle, Needham's Skimmer, Citrine Forktail, Black Saddlebags	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	none mapped	
Wellheads and wellhead protection zones	A single public Water Supply well is adjacent to the northern boundary of this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	71 acres	20 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives		



Beginning with HABITAT

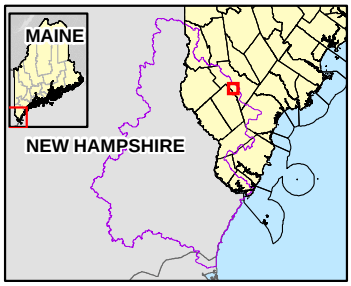
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.125 0.25 0.5 Mile
0 0.125 0.25 0.5 Kilometer

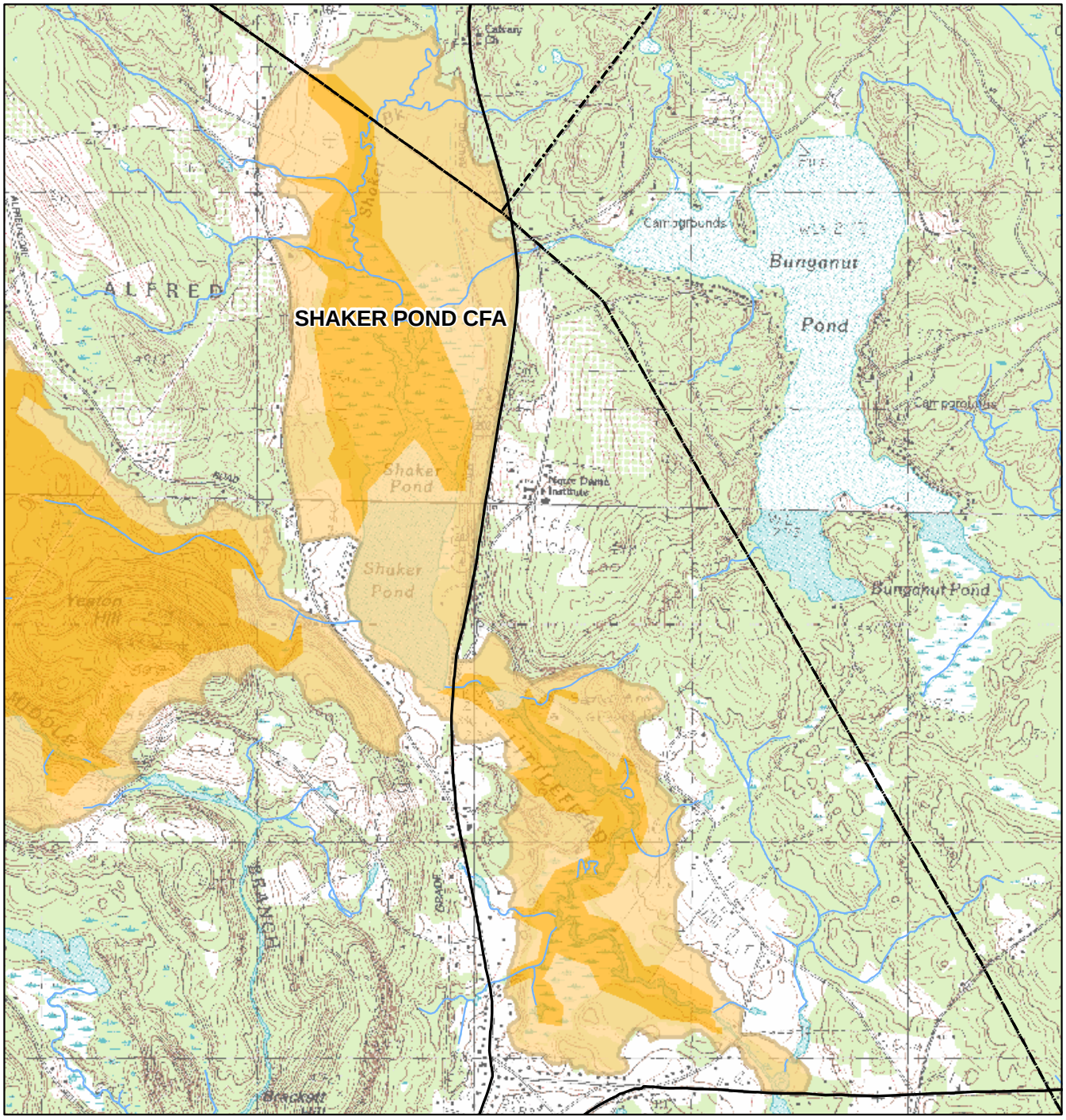
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:16,000

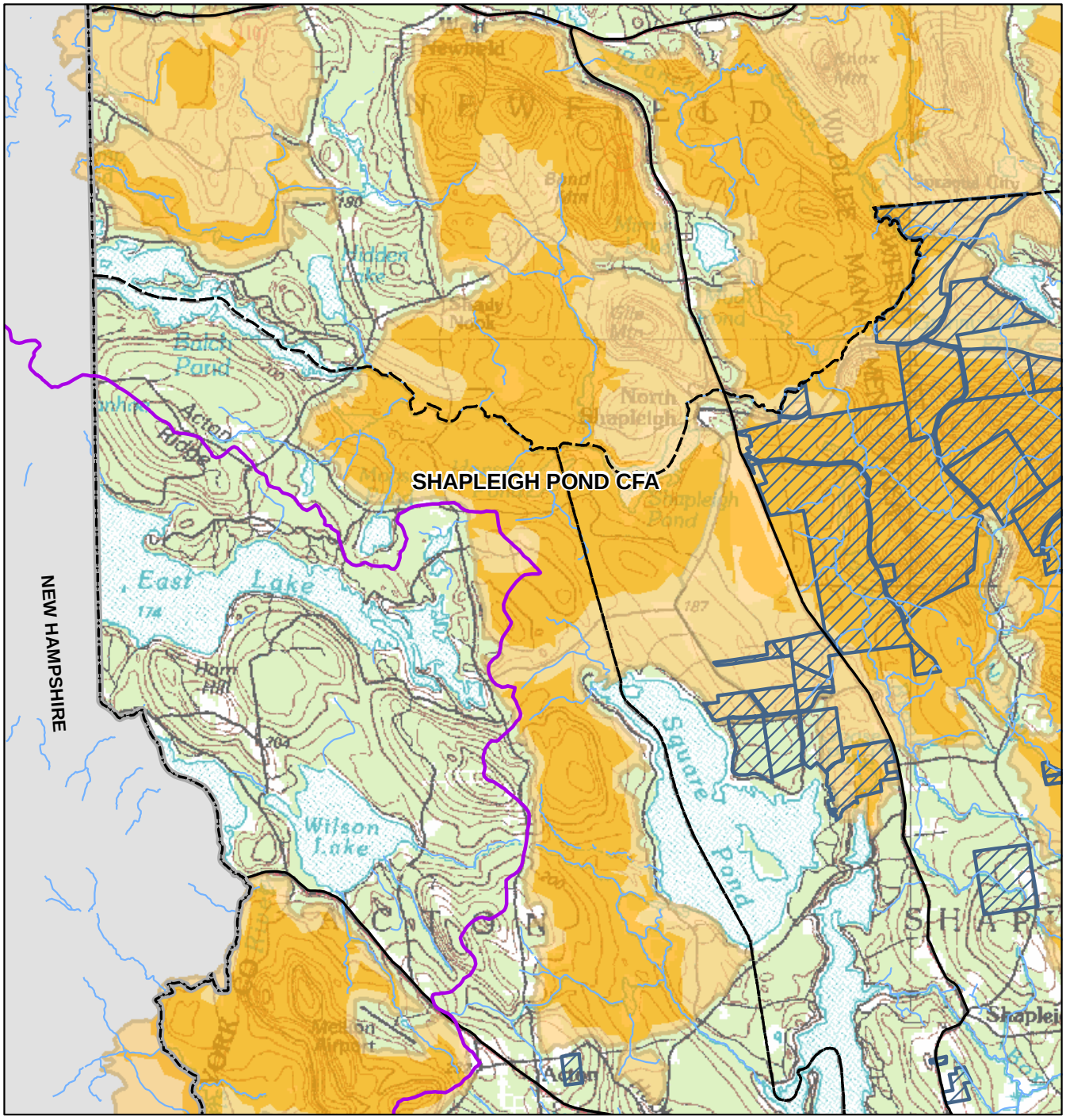
Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



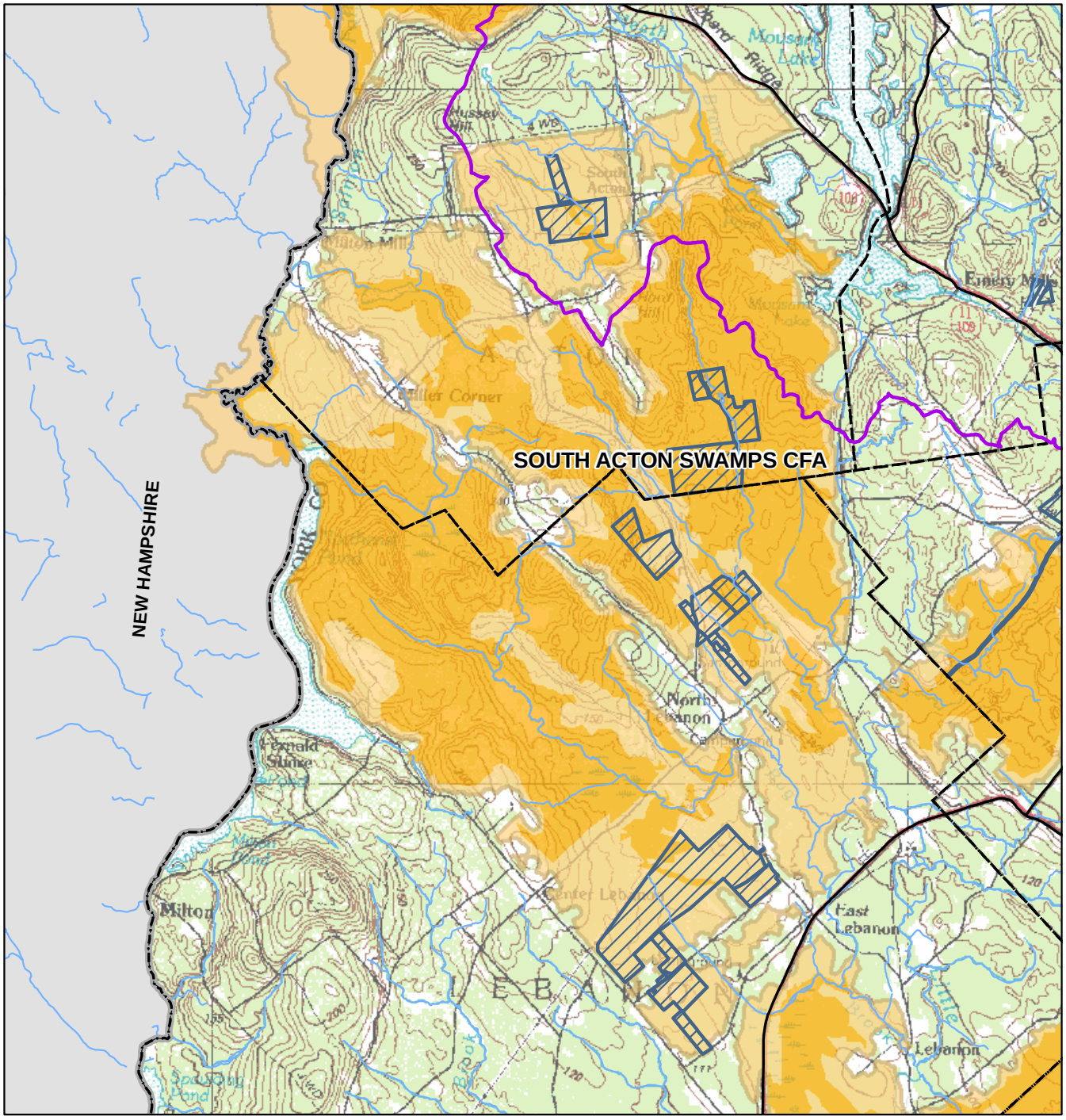
SANFORD PONDS		
TOWNS: Sanford, North Berwick		
WATERSHED: Great Works River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	907 acres	393 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	747 acres	166 acres
Area w/in unfragmented forest block	556 acres	71 acres
Freshwater Systems		
Undeveloped stream reaches	25	8
River & stream miles	5 miles	0.3 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	5 mapped totaling 78 acres	1 additional IWWH and 37 additional acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Atlantic White Cedar, Spotted Wintergreen, Yellow-eyed Grass	
Rare animal populations	Blanding's Turtle, Hessel's Hairstreak, Ribbon Snake, Spotted Turtle	
Rare natural communities	Atlantic White Cedar Swamp, Pitch Pine-Scrub Oak Barrens	
Exemplary natural communities and ecosystems	Leatherleaf Bog, Sandy Lake Bottom	
Water Supply		
High yield aquifer	Most of this CFA is located over a Significant sand and gravel aquifer	
Wellheads and wellhead protection zones		
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	63 acres	32 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The Sanford Ponds region is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority Sanford Pond is identified as a Priority Open Space Area by Sanford's Conservation Plan	


SHAKER POND CFA
ALFRED
Bunganut Pond
Shaker Pond
Shaker Pond
Bunganut Pond
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:24,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

SHAKER POND		
TOWNS: Alfred, Waterboro		
WATERSHED: Shaker Brook, Littlefield River (Mousam River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	337 acres	642 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	270 acres	297 acres
Area w/in unfragmented forest block	none mapped	none mapped
Freshwater Systems		
Undeveloped stream reaches	15	1
River & stream miles	1.7 miles	0.3 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	2 mapped totaling 220 acres in core	113 additional acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Swamp White oak, Wild Indigo	
Rare animal populations	Blanding's Turtle, Spotted Turtle, Northern Black Racer, Ribbon Snake, Least Bittern, Ringed Boghaunter	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	Sedge Meadow	
Water Supply		
High yield aquifer	Most of this CFA is located over a Significant sand and gravel aquifer	
Wellheads and wellhead protection zones	Public Water Supply wells occur in the northern portion of this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	no conservation lands known	no conservation lands known
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Shaker Pond is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority	


SHAPLEIGH POND CFA
NEW HAMPSHIRE
East Lake
Wilson Lake
Square Pond
Batch Pond
Acton Ridge
Ham Hill
North Shapleigh
Shapleigh Pond
Hidden Lake
Bond Hill
Mellon Airport
Acton
Shapleigh
T O N
S H A P
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:60,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

SHAPLEIGH POND		
TOWNS: Newfield, Acton, Shapleigh		
WATERSHED: Branch Brook, Little Ossippee River, Square Pond, Mousam Lake		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	4,549 acres	2,554 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	4,477 acres	920 acres
Area w/in unfragmented forest block	3,895 acres	36 acres
Freshwater Systems		
Undeveloped stream reaches	61	19
River & stream miles	14 miles	0.7 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	11 mapped totaling 319 acres in core	89 additional acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	none mapped	none mapped
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Chestnut Oak	
Rare animal populations	Ribbon Snake	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	Most of this CFA is located over a Significant sand and gravel aquifer	
Surface water intakes		
Wellheads and wellhead protection zones		
Agricultural Lands	Prime or statewide importance farm soils	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	no conservation lands known	no conservation lands known
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives		



Beginning with HABITAT

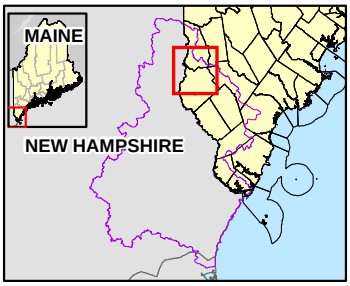
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.5 1 2 Miles
0 0.5 1 2 Kilometers

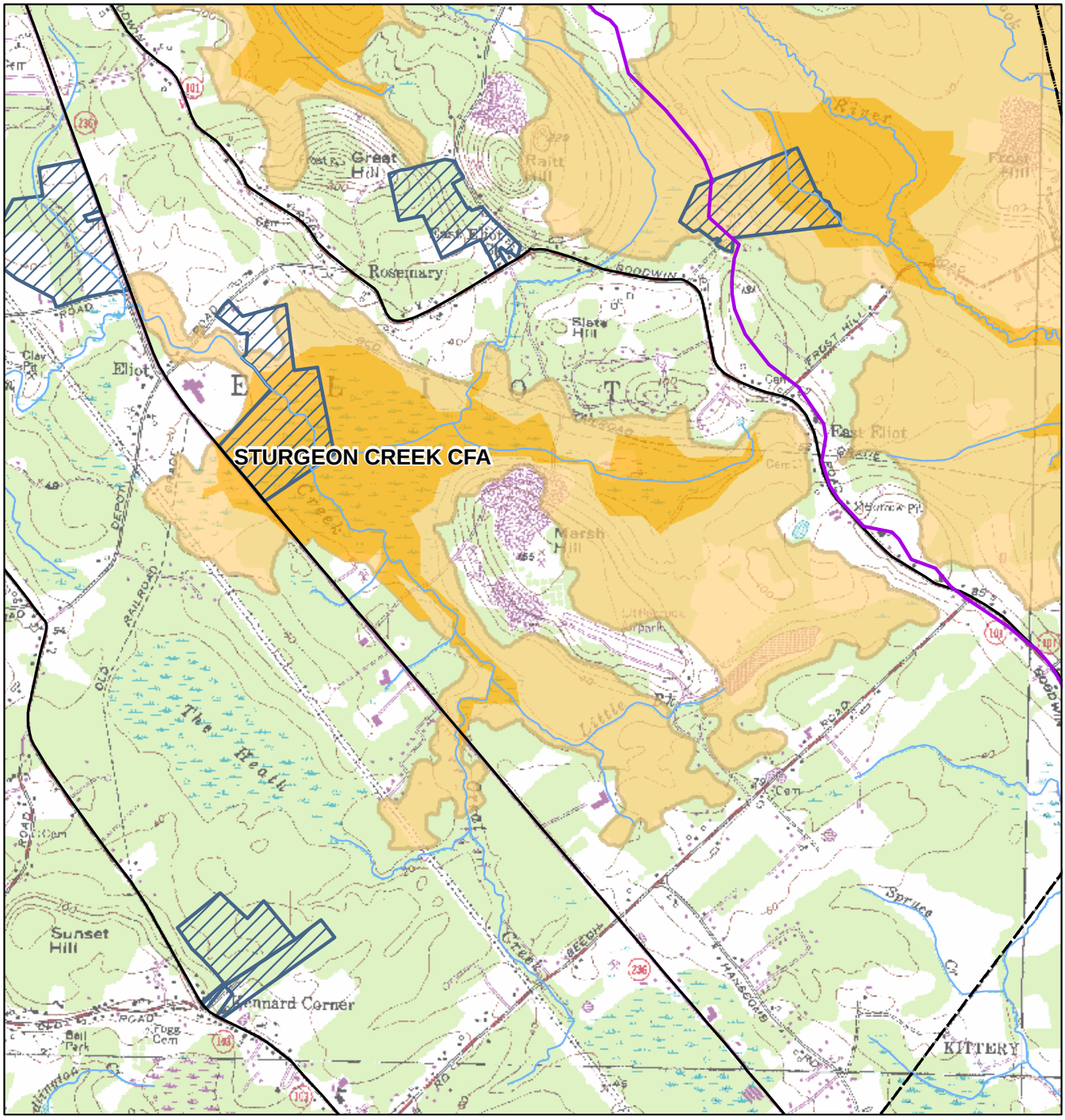
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:75,000

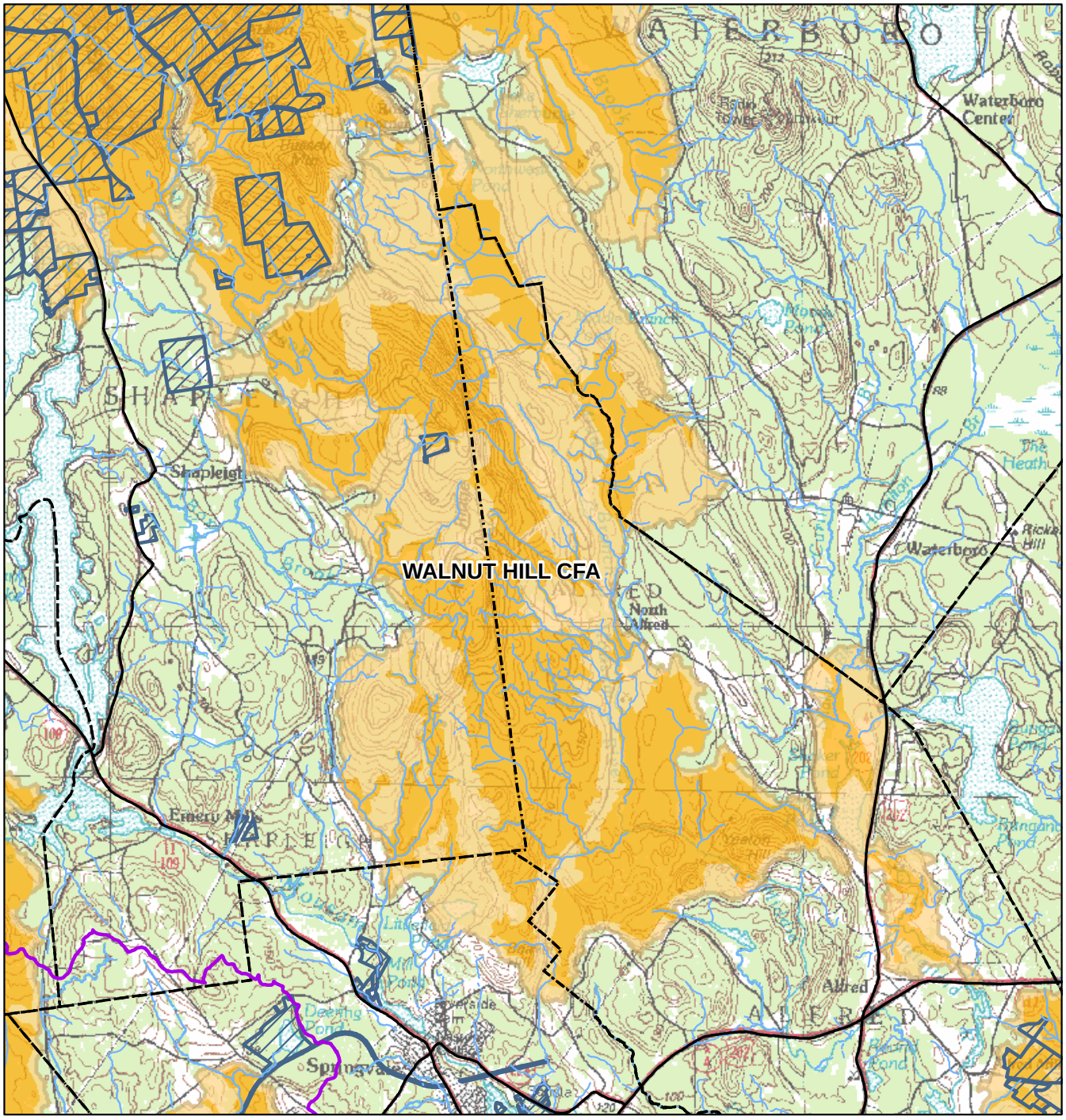
Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



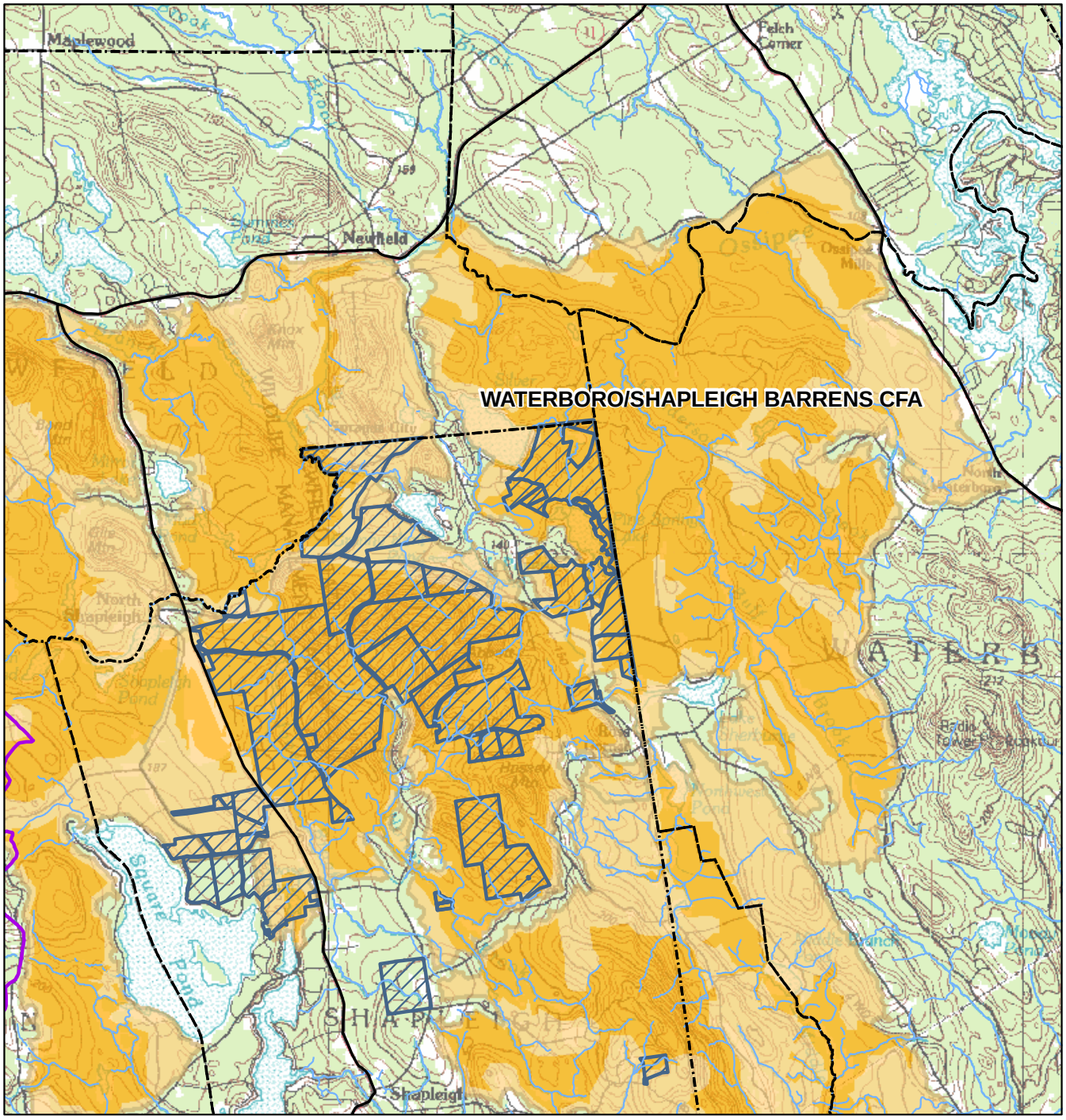
SOUTH ACTON SWAMPS		
TOWNS: Acton, Lebanon, Sanford		
WATERSHED: Little River, Bog Brook, Salmon Falls River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	9,268 acres	8,481 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	9,091 acres	6,543 acres
Area w/in unfragmented forest block	7,625 acres	1,457 acres
Freshwater Systems		
Undeveloped stream reaches	86	63
River & stream miles	30 miles	11 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	23 mapped totaling 494 acres in core	84 additional acres and 4 additional IWWH
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	1,270 acres	216 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations		
Rare animal populations		
Rare natural communities		
Exemplary natural communities and ecosystems		
Water Supply		
High yield aquifer	Mapped sand and gravel aquifers are concentrated in the southeastern portion of this CFA	
Wellheads and wellhead protection zones	5 public Water Supply wells occur in the southern portion of this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	474 acres	1,362 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The north central portion of this CFA is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority	


STURGEON CREEK CFA
Great Hill
Rosemary
Slate Hill
Eliot
East Eliot
Marsh Hill
Sunset Hill
Bennard Corner
KITTERY
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:24,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

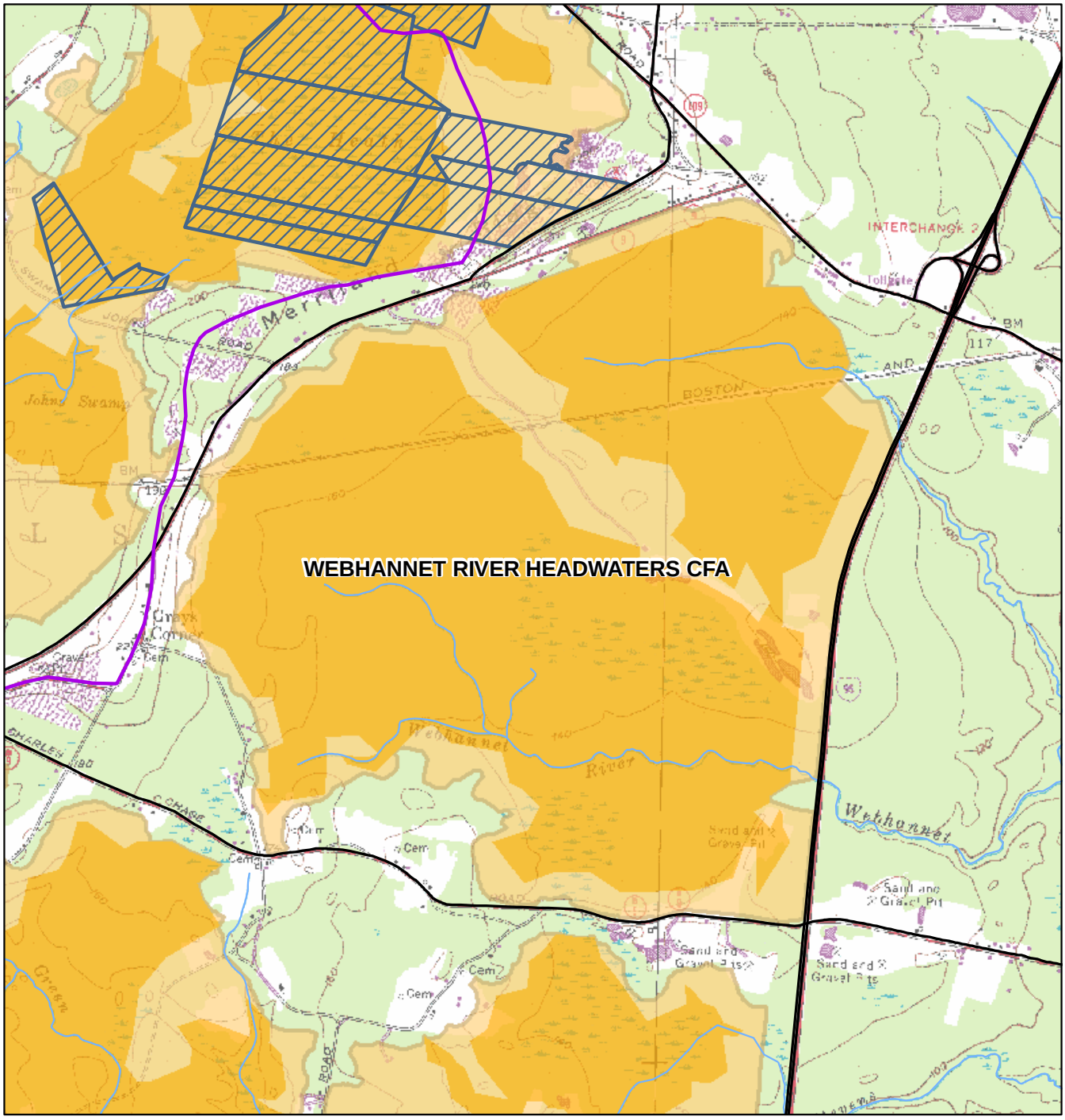
STURGEON CREEK		
TOWNS: Eliot		
WATERSHED: Sturgeon Creek (Salmon Falls River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	296 acres	623 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	220 acres	311 acres
Area w/in unfragmented forest block	none mapped	none mapped
Freshwater Systems		
Undeveloped stream reaches	12	4
River & stream miles	2 miles	0.1 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	5 mapped totaling 188 acres in core	45 additional acres and 2 additional IWWH
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	77 acres	67 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Pendulous Bulrush, Spicebush, Swamp White Oak	
Rare animal populations	Blanding's Turtle, Juniper Hairstreak, New England Cottontail	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	none mapped	
Wellheads and wellhead protection zones	none mapped	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	49 acres	6 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	GWRLT Conservation Plan	


WALNUT HILL CFA
WATERBORO
Waterboro Center
SHAPLEIGH
Shapleigh
Emery Mills
North Alfred
Alfred
Springvale
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:75,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

WALNUT HILL		
TOWNS: Alfred, Shapleigh, Sanford, Waterboro		
WATERSHED: Mousam River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	6,730 acres	6,713 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	6,580 acres	4,427 acres
Area w/in unfragmented forest block	4,653 acres	562 acres
Freshwater Systems		
Undeveloped stream reaches	323	114
River & stream miles	57 miles	11 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	25 mapped totaling 410 acres in core	87 additional acres and 2 additional IWWH
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	108 acres	162 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Butternut Hickory, Spicebush, Swamp Saxifrage	
Rare animal populations	Blanding's Turtle, Wood Turtle, Northern Black Racer	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	none mapped	One significant sand and gravel aquifer mapped south of Northwest Pond
Wellheads and wellhead protection zones	none mapped	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	13 acres	10 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The southwestern portion of this CFA is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority Alfred and Shapleigh Conservation Commissions are currently working in partnership with Three Rivers Land Trust to conserve land in this CFA The Sandford open space plan includes a portion of this CFA within its Little Field Pond open space priority area	


WATERBORO/SHAPLEIGH BARRENS CFA
Maplewood
Felch Corner
Newfield
Shapleigh
Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:75,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

WATERBORO/SHAPLEIGH BARRENS		
TOWNS: Waterboro, Shapleigh, Newfield		
WATERSHED: Branch Brook, Jones Brook, Buff brook, Henderson Brook (Little Ossippee River)		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	14,213 acres	7,404 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	13,500 acres	4,935 acres
Area w/in unfragmented forest block	9,354 acres	577 acres
Freshwater Systems		
Undeveloped stream reaches	303	73
River & stream miles	65 miles	4.4 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	39 mapped totaling 890 acres in core	125 additional acres and 10 additional IWWH
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	2905 acres	277 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Missouri Rockcress, Ebony Spleenwort, Fern-leaved False Foxglove, Upright Bindweed, Dry Land Sedge, Fogg's Goosefoot, Spotted Wintergreen, Autumn Coral-root, Bottlebrush Grass, Narrow-leaved Goldenrod, Rattlesnake Hawkweed, Smooth Winterberry Holly, Small Whorled Pogonia, Dwarf Dandelion, Spicebush, Clammy Azalea, Swamp Saxifrage	
Rare animal populations	Similar Underwing, Barrens Chaetaglaea, Northern Black Racer, Blanding's Turtle, Sleepy Duskywing, Wood Turtle, The Buckmoth, Barrens Itame, Southern Pine Sphinx, Twilight Moth, Edwards' Hairstreak, New England Cottontail, Ribbon Snake, Southern Cloudywing, Ebony Boghaunter, Ringed Boghaunter, Acadian Swordgrass Moth, Barrens Xylotype, Red-winged Sallow, Oblique Zale, Pine Barrens Zale, Pine Barrens Zanclognatha	
Rare natural communities	Pocket Swamp, Oak - Ash Woodland, Pitch Pine - Scrub Oak Barren, Outwash Plain Pondshore, White Oak - Red Oak Forest	
Exemplary natural communities and ecosystems	Tall Sedge Fen, Oak - Pine Woodland, Red Maple Swamp	
Water Supply		
High yield aquifer	Much of the CFA is underlain by Significant sand and gravel aquifers	
Wellheads and wellhead protection zones	A public supply well is located on the west side of Pine Springs Lake	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	9,957 acres	2,378 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The Waterboro / Shapleigh Barrens region is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority	



Beginning with HABITAT

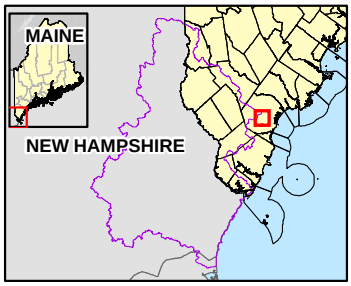
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

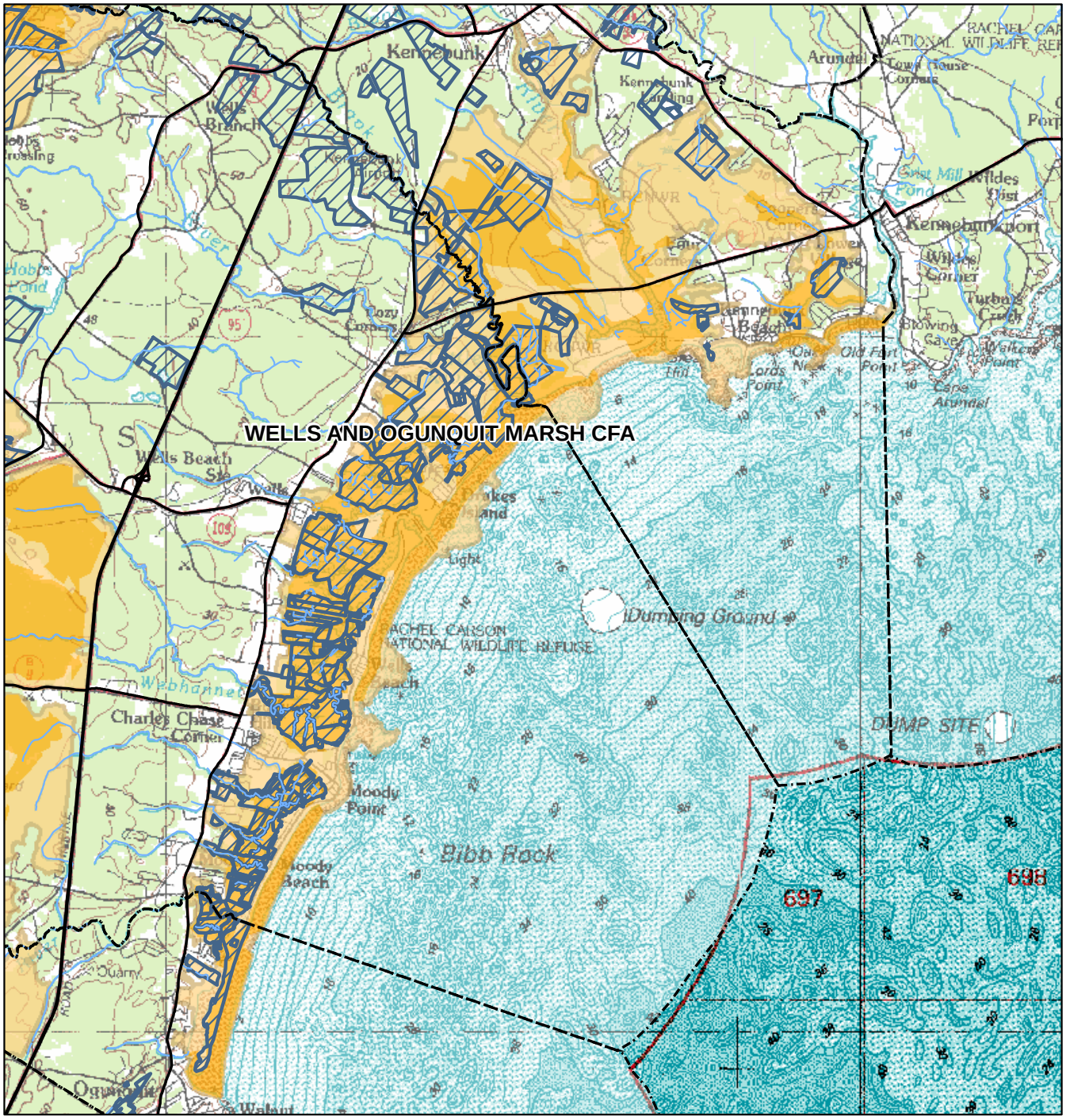
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

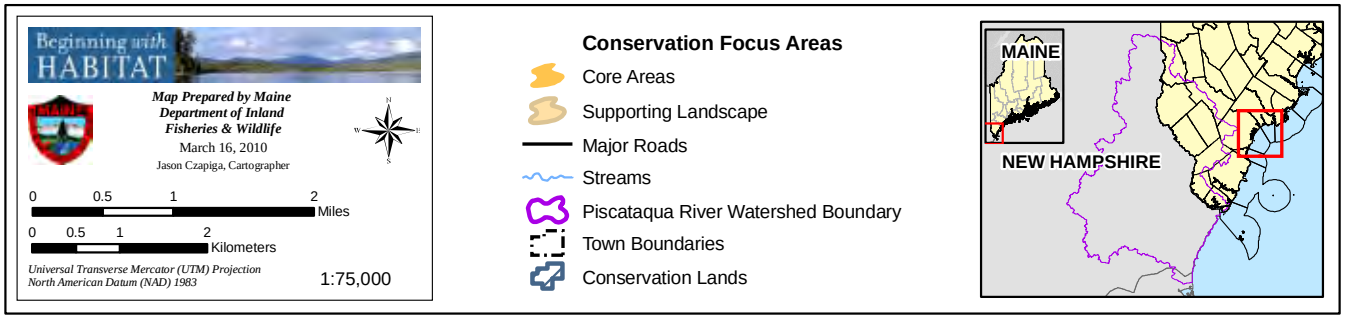
1:24,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands

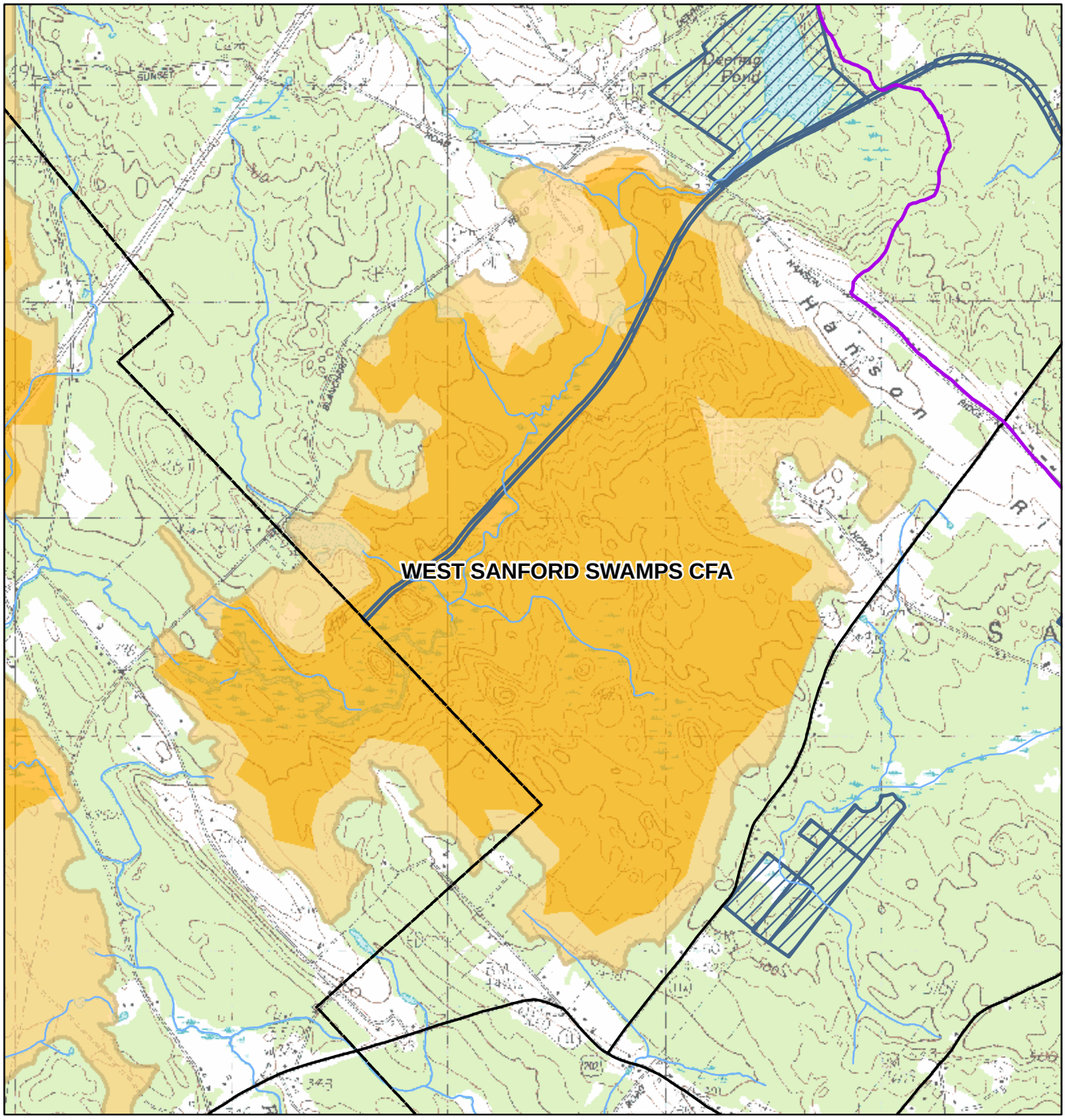


WEBHANNET RIVER HEADWATERS		
TOWNS: Wells		
WATERSHED: Webhannet River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1,450 acres	391 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	1,415 acres	88 acres
Area w/in unfragmented forest block	1,079 acres	2 acres
Freshwater Systems		
Undeveloped stream reaches	6	
River & stream miles	3 miles	
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	1 mapped totaling 4 acres in core	1 additional acre in supporting landscape
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	387 acres	15 acres
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Spicebush	
Rare animal populations	Spotted Turtle	
Rare natural communities	none mapped	
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	none mapped	
Wellheads and wellhead protection zones	A public supply well is located along the western edge of this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	No protected land on record	
	Permanently Protected, Managed primarily as working forest (GAP 3)	
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	GWRLT Conservation Plan	
	Wells NERR	
	Town of Wells	


WELLS AND OGUNQUIT MARSH CFA
Kennebunk
Wells Branch
Kennebunkport
Arundel
Wells Beach
Wells
Dumping Ground
RACHEL CARSON NATIONAL WILDLIFE REFUGE
DUMP SITE
Webhannet
Charles Chase Corner
Moody Point
Moody Beach
Bibb Rock
Ogunquit
Walnut
697
698


Beginning with HABITAT
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
1:75,000
Conservation Focus Areas
Core Areas
Supporting Landscape
Major Roads
Streams
Piscataqua River Watershed Boundary
Town Boundaries
Conservation Lands
MAINE
NEW HAMPSHIRE

WELLS AND OGUNQUIT MARSH		
TOWNS: Kennebunk, Wells, Ogunquit		
WATERSHED: Ogunquit River, Stevens Brook, Webhannett River, Depot Brook, Blacksmith Brook, Merriland River, Branch Brook, Mousam River		
	CORE AREA	**SUPPORTING LANDSCAPE**
SIZE	4,305 acres	4,195 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	2,210 acres	1,549 acres
Area w/in unfragmented forest block	459 acres	134 acres
Freshwater Systems		
Undeveloped stream reaches	101	10
River & stream miles	17 miles	2.4 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	3 mapped totaling 13 acres in core	2 additional mapped in supporting landscape totaling 28 acres
Tidal wadingbird waterfowl habitat	40 mapped totaling 2,531 acres	7 additional TWWH totaling 268 acres
Deer wintering area	331 acres	113 acres
Significant vernal pool	none mapped	1 mapped
Shorebird feeding / roosting area	9 mapped totaling 326 acres	3 mapped totaling 20 acres
Significant Plant & Animal Occurrences		
Rare plant populations	Saltmarsh False-foxglove, Beach wormwood, Saltmarsh Bulrush, Pygmyweed, Smooth Winterberry Holly, Slender Blue Flag, Pale Green Orchis, Beach Plum, Spongy Arrow-head, Dwarf Glasswort, Sassafras, American Sea-blite	
Rare animal populations	Saltmarsh Sharp-tailed Sparrow, Piping Plover, Salt Marsh Tiger Beetle, Citrine Forktail, Spot-winged Glider, Least Tern	
Rare natural communities	Brackish Tidal Marsh, Dune Grassland, Freshwater Tidal Marsh, Pitch Pine Bog, Salt-hay Saltmarsh	
Exemplary natural communities and ecosystems	Coastal Dune-marsh Ecosystem, Tidal Marsh Estuary Ecosystem	
Water Supply		
High yield aquifer	Significant sand and gravel aquifers are mapped along portions of Branch Brook, Fernald Brook and the Mousam River within the northeastern extent of this CFA	
Wellheads and wellhead protection zones	A public supply wells are located at the northern and southern edges of this CFA	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	3,788 acres	1,649 acres
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	The Wells and Ogunquit marshes complex is included as a focus area in Maine's Wildlife Action Plan and is identified as a conservation priority GWRLT Conservation Plan Wells NERR Rachel Carson Wildlife Refuge The Town of Kennebunk open Space plan has identified portions of this CFA including Branch Brook, the Mousam River, Lake Brook and Gooch's Creek as highest priority areas	



Beginning with HABITAT

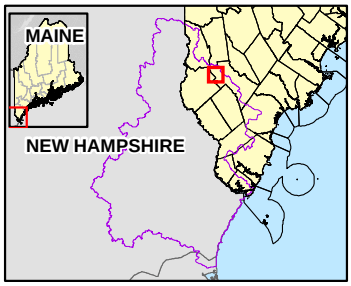
Map Prepared by Maine Department of Inland Fisheries & Wildlife
March 16, 2010
Jason Czapiga, Cartographer

0 0.2 0.4 0.8 Mile
0 0.2 0.4 0.8 Kilometer

Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

1:24,000

Conservation Focus Areas
- Core Areas
- Supporting Landscape
- Major Roads
- Streams
- Piscataqua River Watershed Boundary
- Town Boundaries
- Conservation Lands



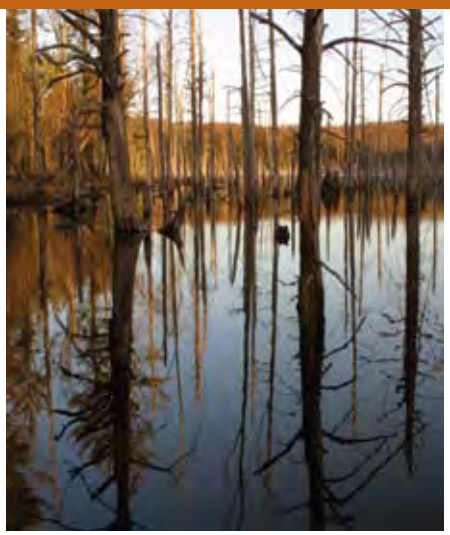
WEST SANFORD SWAMPS		
TOWNS: Sanford, Lebanon		
WATERSHED: Little River		
	CORE AREA	SUPPORTING LANDSCAPE
SIZE	1,256 acres	495 acres
SIGNIFICANT ECOLOGICAL RESOURCES		
Forest Ecosystem		
Area w/in undeveloped habitat block	1,239 acres	376 acres
Area w/in unfragmented forest block	928 acres	14 acres
Freshwater Systems		
Undeveloped stream reaches	16	5
River & stream miles	4 miles	0.25 miles
Significant Wildlife Habitat		
Inland wadingbird and waterfowl habitat	3 mapped totaling 127 acres in core	1 additional mapped insupporting landscape totaling 14 acres
Tidal wadingbird waterfowl habitat	n/a	n/a
Deer wintering area	n/a	n/a
Significant vernal pool	none mapped	none mapped
Shorebird feeding / roosting area	n/a	n/a
Significant Plant & Animal Occurrences		
Rare plant populations	Swamp Saxifrage	
Rare animal populations	none mapped	
Rare natural communities	Hemlock-Hardwood Pocket	Swamp
Exemplary natural communities and ecosystems	none mapped	
Water Supply		
High yield aquifer	none mapped	
Wellheads and wellhead protection zones	none mapped	
CURRENT CONSERVATION STATUS		
Permanently Protected, Managed as natural area or ecological reserve (GAP 1 & 2)	13 acres	1 acre
Permanently Protected, Managed primarily as working forest (GAP 3)		
Not permanently protected, but in public or institutional ownership (GAP 3a)		
RELATIONSHIP TO OTHER PLANS		
Area identified in other planning initiatives	Much of this CFA has been identified as a priority open space area in Sanford's Open Space plan	

SECTION V:
IMPLEMENTING THE CONSERVATION PLAN

This plan is of little value if communities in the region do not pursue actions that conserve and protect the critical natural areas identified in it. Over the past decade a great deal of work has gone into developing both regulatory and non-regulatory strategies for conservation and resource protection. Local land trusts and statewide conservation organizations have also been very active in assisting in these efforts. It is now clear that a mix of local regulatory strategies, developing additional sources of revenue, pursuing land acquisition, and incorporating organizations that may serve as conservation partners into a broad-based effort are all essential components to successfully protecting the water quality and wildlife habitat of the region. In other words, no single strategy or agency is positioned to do this alone.

This plan recommends seven implementation actions that can be collectively used to protect Conservation Focus Areas:

1. Interagency Adoption and Use of the Plan
2. Pursue Permanent Land Protection
3. Incorporate Conservation Plan into Municipal Comprehensive Plans and Planning in General
4. Increase Municipal Capacity for Open Space Planning
5. Provide Outreach/Education to Landowners, Citizens, and Leaders
6. Update Local Regulations
7. Raise Revenues for Local Land Conservation



ERIC ALDRICH/NATURE CONSERVANCY

Each of these strategies is discussed below, and provides guidance for the work of conservation organizations, municipalities, and citizens who will put this plan into action on the landscape. Some of this guidance has been extracted from the *Beginning with Habitat Guidebook*, and some comes from examples of work already successfully undertaken by towns in the region.

IMPLEMENTATION STRATEGY #1: INTERAGENCY ADOPTION AND USE OF THE PLAN

A major purpose of this Plan is to serve as a framework for land conservation in the Maine portion of the Piscataqua River watershed. The framework pertains both to the physical landscape to be conserved as well as the policies that should be adopted to implement the plan. State and local governments should consider both aspects as they develop and pursue conservation objectives. The following goals may serve as the basic policy framework that should be considered by all levels of government in adopting and implementing the plan:

- Protect land areas with key natural resource features that provide the ecological functions necessary to sustain a healthy environment. These resource values form the basis of the Conservation Focus Areas and include the following attributes: unfragmented forest ecosystems; high quality stream watersheds; irreplaceable coastal and estuarine resources; high-quality wetland systems; riparian zones on freshwater and tidal rivers; streams, lakes and ponds; exemplary natural communities; and significant wildlife habitat.
- Protect the quality and quantity of surface and groundwater, including aquifers, rivers, lakes and reservoirs used for private and public water supplies.
- Maintain land and resources that provide protection from natural hazards, such as flooding and drought.

- Adopt the Conservation Focus Area Core Areas as priorities for protection through conservation easements and fee simple acquisition.
- Establish land use rules that minimize future rural sprawl and slows, or avoids further fragmentation and degradation of Conservation Focus Area core and supporting landscape areas.
- Explicitly include the Conservation Focus Areas in state, regional, and local conservation planning efforts, and in the development of future land use plans.
- Encourage compact development and other regulatory and voluntary means to minimize impacts from direct development in Conservation Focus Area.

Implementing such policies will require **action** by all levels of government, as well as the private sector. To ensure that the Plan becomes the "green print" for action, the Plan should be adopted and actively used by all parties that have a role in its implementation.

State agencies and related entities such as the Department of Environmental Protection; the Maine State Planning Office; the Maine Department of Transportation; Soil and Water Conservation Districts; regional organizations such as Southern Maine Regional Planning Commission; the Wells National Estuarine Research Reserve; and partnership-based organizations such as Mt. Agamenticus to the Sea Conservation Initiative should use the plan in their grant applications, land use planning activities, and public education and outreach activities. The groups should also ensure the plan is available to the public for individuals interested in private stewardship of important natural resource features.

Town Select Boards or Town Councils should consider adopting the Plan as an element of their local Comprehensive Plans to establish the basis for any zoning or regulatory standards they may enact that apply specifically to development within Conservation Focus Areas. Local Planning Boards should utilize this plan as a reference when evaluating specific development projects, and as importantly when considering revisions to local land use ordinances. Conservation Commissions and Open Space / Land Conservation Committees should utilize the Plan to inform local conservation priorities and to develop or amend local strategic conservation plans.

Private non-profit conservation organizations, watershed protection groups, land trusts, regional greenway organizations, and others can use the Plan to direct and prioritize their programs to protect and manage land for conservation. This plan provides information necessary in the development of a land trust strategic conservation plan as recommended for land trust accreditation purposes.

In summary, the Plan provides a rich and valuable resource for those interested in pursuing local and regional conservation efforts within the watershed.

IMPLEMENTATION STRATEGY #2: PURSUE PERMANENT LAND PROTECTION

Direct land acquisition through outright purchase in fee, donation, or by securing development rights with a conservation easement is the most reliable way to permanently protect ecologically important areas. The activity and capacity of local and regional land trusts has grown exponentially in recent years. Land trusts organizations are typically the leaders in implementing land conservation projects, and are key partners for municipalities wishing to support and pursue land conservation. Land trusts in the region covered by this plan are encouraged to use this plan to guide, inform, supplement, and support existing conservation priorities that they may have already identified. The existence of this plan is a powerful tool to identify conservation hot spots and to support fundraising efforts for land conservation projects located within Conservation Focus Areas.

Landowners interested in ensuring their land is permanently protected from development impacts can learn about their options from local land trust staff as well as published information such as of "Conservation Options, A Guide for Maine Landowners" from the Maine Coast Heritage Trust. (**www.mcht.org/mchtnews/pdf/mchtconsoptions.pdf**)

Given that money available for land acquisition will always be in limited supply, investments must be made strategically and be backed up by sound ecological principles. The Conservation Focus Areas identified by this plan are intended to help conservation organizations and municipalities zero in on those truly irreplaceable landscapes. Direct investments to protect these areas are appropriate and should be completed in a way that increases public awareness of the significance of the Conservation Focus Areas and inspires other landowners within the Conservation Focus Areas to consider conservation options whether easements or conservation friendly approaches to development that can contribute to a lasting conservation legacy for future generations.

Steps to consider in strategically protecting irreplaceable landscapes within the Conservation Focus Areas:

- Assess existing level of threat to individual parcels within the Conservation Focus Areas. Which parcels have significant frontage on public roads and soil and topographic conditions that could support development? Reach out to these landowners and gauge their interest in conservation. If they are planning on developing their land, are there options available such as conservation subdivisions that would allow development to occur in a manner that maintains significant ecological functions of the parcel? Are there large landlocked parcels that support rare element occurrences, yet have limited

development potential? Perhaps these landowners would be interested in conservation options that could help reduce their tax burdens.

- Coordinate land trust priorities for land protection with town priorities. Many land trusts are undertaking strategic conservation plans for accreditation purposes, these plans are very similar to municipal open space plans and both can build off of each other. Lands listed as priorities for both partners have greater chance for funding success through the various conservation sources available.
- If direct acquisition is not an option in the near term, landowners within the Conservation Focus Area core and supporting landscape should be encouraged to enroll their lands in either the Farmland and Open Space or Tree Growth Tax Programs. Although this approach does not offer permanent protection, it can enable the landowner to better afford local tax burdens thereby relieving pressure to develop the property.
- Similarly, towns may wish to set aside funds in their municipal budgets to purchase conservation leases from land owners who do not wish to develop, but may not be ready to enter into a permanent easement. This stop gap measure allows municipalities to then have the first right to refusal should the landowner wish to sell at the end of the lease term.
- As towns complete local open space plans that identify local priorities for conservation, they should consider local bonds to fund acquisition projects. This can be another opportunity to partner with local land trusts for political support and also to further leverage local investments by attracting state, federal, and private grant dollars.
- Impact fees and/or development transfer fees are commonly used approaches for raising local funds for priority land acquisition projects. Impact fees are typically charged on a per residential unit basis to pay for municipal costs associated with public needs, in this case open space. Transfer of development fees, also charged on a per unit basis, are typically paid by a developer who wants to build units in a growth area above and beyond what current densities allow. The fee then is used to purchase open space in a priority area of town.

Refer to the Beginning with Habitat online toolbox at **www.beginningwithhabitat.org/toolbox/about_toolbox.html** for more information regarding any of these suggestions.

IMPLEMENTATION STRATEGY #3: INCORPORATE CONSERVATION PLAN INTO MUNICIPAL COMPREHENSIVE PLANS AND PLANNING IN GENERAL

Protection of a functional natural landscape capable of supporting today's biodiversity cannot rely on buying land or development rights alone. Municipal planning activities that guide land use and development patterns and practices are key determinants of how well the future landscape will provide clean water and quality wildlife habitat for future generations to enjoy. This section of the plan focuses on the many planning tools available to municipalities to effectively shape the destiny of the local and regional landscape with respect to water quality, wildlife habitat, and quality of life.

Comprehensive Plans

Comprehensive plans are the legal underpinning of zoning ordinances intended to assure that the power of zoning is not used arbitrarily, unfairly, or without attention to documented needs. Today's Growth Management Act encourages towns to complete comprehensive plans structured around several required elements and specific topic areas each intended to facilitate a thorough evaluation of common planning issues at the local level. Many of the specific topics to be covered are directly related to natural resource issues and have implications for the long-term persistence of plant and animal habitat in the local landscape. Beginning with Habitat currently provides data and suggestions to help towns best evaluate local strategies to address these resource issues – this plan can provide further information and support regarding which resource areas are truly priorities for future land use planning efforts. Comprehensive planning elements

required by the Growth Management Act that can benefit from information in this conservation plan include:

- Transportation
- Recreation
- Marine Resources
- Water Resources
- Critical Natural Resources
- Agriculture & Forestry
- Land Use
- Climate Change
- Regional Coordination
- Future Land Use Plan

For each of these planning elements, Beginning with Habitat provides specific guidance on effective ways to protect natural resources when a municipal Comprehensive Plan is updated. This guidance should be utilized by every municipality that creates or updates their Comprehensive Plan and can be accessed at the Beginning with Habitat Toolbox: **www.beginningwithhabitat.org/toolbox/compplan_guide.html**

When the comprehensive plan is updated, particular attention should be paid to existing and proposed growth areas and the establishment of "critical rural areas." The town should evaluate if the Conservation Focus Areas (CFAs) identified in this plan are located in a proposed growth area or rural area. Because of the build-out in some municipal growth zones, many towns are now developing additional growth areas. Prudent questions to ask include:

- Do these growth areas conflict with the identified resources in the CFA?
- Are the growth areas extending into large undeveloped blocks of habitat?

- Does the town have future road or utility plans for these undeveloped blocks?

In many instances town infrastructure policies contribute to the fragmentation, degradation and/or destruction of habitat. The Maine Comprehensive Planning law also includes a provision for establishing a "critical rural area." CFAs identified in this plan might be included as part or all of such a zone.

Future Land Use Plan

How can critical resource areas be effectively protected from future development impacts? This key question is what a Future Land Use Plan is intended to address. A future land use plan is intended to synthesize the elements of a comprehensive plan into a cohesive guide to realizing a community's vision – it is a blueprint both for future growth of a community and long-term conservation of critical natural areas. Once a community has determined where it wants to grow, and what it values as critical natural resources for the future it is ready for effective plan implementation.

Regional Coordination

Traditionally, Beginning with Habitat data has been well utilized by towns to document existing important habitats and significant resources. This conservation plan should supplement Beginning with Habitat data and provide further support to the need for regional coordination and the importance of designating critical rural areas for effective local resource protection. The plan has been created specifically to provide local planners with a better sense of where important conservation opportunities are that cross town lines, where multiple communities share rivers, streams, and ponds, and where important habitats are distributed across the region. Water and wildlife to not move in accordance with political boundaries, and thus efforts to preserve water quality and wildlife habit must be regional in nature. The landscape context provided in this plan is intended to encourage inter-municipal cooperation on effectively protecting the best remaining landscapes in the greater Piscataqua Region of Maine.

IMPLEMENTATION STRATEGY #4: INCREASE MUNICIPAL CAPACITY FOR OPEN SPACE PLANNING

A town should consider the following tasks as a means to institutionalizing open space planning and conservation in the community. In many respects, it is appropriate to consider natural resource protection in the same manner that we examine other town services and infrastructure (i.e., as items that need to be assessed and budgeted for).

- Form a town Conservation Commission if one doesn't already exist. The Conservation Commission can play an active role in managing town-owned open space and creating and implementing an Open Space Plan.
- Inventory all public conservation lands in your town and review the management plans for these properties. Include publicly-owned lands that have conservation potential but are not yet designated as such. Work with local planners, land trusts, and state agencies to evaluate the status of habitat protection and recreational opportunities on these lands. Design corridors that allow species to move freely between protected areas along interconnecting riparian areas and undeveloped terrestrial linkages and work with landowners to piece together these connections.
- Create an Open Space Plan for your town. Utilize the Conservation Focus Areas identified in this plan as areas for both the land trust and town to concentrate their efforts. Work with a local land trust, Beginning with Habitat, or a consulting planner to inventory local parcels of land that could, in combination with other private or public lands, respond to Conservation Focus Area priorities. Conduct a public meeting with residents to identify additional areas of natural resource or open space protection. Ask residents to identify those areas in town that are most important to them including additional habitat or rare features not currently mapped, geologic features, historical sites, scenic views, important landscapes, farms, and trail systems.
- If your town has a Capital Improvement Plan, include a land bank account to be added to annually and spent according to a specific set of guidelines for the acquisition of habitat and open space lands. The town conservation commission could select lands for purchase with the expenditure dependent upon approval at town meeting.
- Consider creating trail corridors that serve wildlife and recreation needs.
- Create a local planning process to evaluate the accumulated amount of shoreline development as it relates to habitat loss. Design a local conservation strategy that offers an alternative to single lot development of shoreline areas. Meet with town recreation officials, local land trusts, and conservation organizations and discuss combining the conservation of riparian habitat with recreational access to water resources.
- Evaluate opportunities to create greenways and corridors between parcels or add additional lands to create large blocks of protected, high value habitat.
- If a land trust does not already exist for your town, create one or ask a neighboring land trust to expand its service area.

BEN KIMBALL

Grass-pink orchid (*Calopogon tuberosus*).

IMPLEMENTATION STRATEGY #5:
PROVIDE OUTREACH/EDUCATION TO LANDOWNERS, CITIZENS, AND LEADERS

An important component of any local conservation effort involves developing good ideas *and* effectively presenting them to the public. Based on ideas already implemented in a number of Maine communities, the Beginning with Habitat Guidebook provides the following list of some of the methods used to focus citizen action on natural resource protection:

- Conduct an outreach effort to inform landowners of the value of riparian habitat, high value plant and animal habitats, and large undeveloped habitat blocks.
- Develop a database of local property owners who host Significant or Essential Habitat. Create local support systems that supply these landowners with information on habitat retention and improvement. Create local reward and incentive programs for these landowners. Potential local (i.e., town-administered) programs include purchase of development rights, a transfer of development rights program, waiving lot size requirements in exchange for habitat protection, and an "open space" tax reduction program in addition to the state-administered Current Use Program.
- Conduct outreach to landowners who might benefit from a "current use" tax status, such as the Open Space or Tree Growth Tax Programs. Suggest they examine estate and tax planning with the Maine Coast Heritage Trust or an attorney in order to conserve large parcels of land they own.

- Create a local recognition or reward system for landowners who maintain open space through current use programs.
- Invite local legislators to tour high value habitats in your town and explain the connection between the habitats and your community's way of life. Talk to them about legislation and policies that would make it easier to conserve the habitats and, therefore, community character.
- Provide a list of licensed foresters with a working knowledge of how to manage forests for both habitat and timber.
- Offer a workshop for forest landowners using *Biodiversity in the Forests of Maine: Guidelines for Management*, published by the Maine Forest Biodiversity Project, and *A Forester's Guide to Managing Wildlife Habitats in Maine*, published by UMaine Cooperative Extension and the Maine Chapter of The Wildlife Society.
- Offer space in the town Annual Report for the local land trust to write a summary of past and planned activities.
- Conduct a joint mailing from the land trust and the town to landowners of important parcels offering conservation options and services.
- Invite the local land trust to display newsletters and brochures at the town hall, library, and public events.
- Make the Beginning with Habitat maps and documentation readily available to the public so they can view them easily and become familiar with the information.

IMPLEMENTATION STRATEGY #6: UPDATE LOCAL REGULATIONS

As a home rule state, the vast majority of land use decisions in Maine are made by local town staff, boards, and committees. Municipalities throughout the state are shaping tomorrow's habitats and determining the future success of species each and every day. Land use tools are often the only approach municipalities have to effectively encourage growth in appropriate areas and discourage growth where it could degrade community values including natural resources. Many towns, both big and small, with professional planning staff or solely reliant on volunteer committees, have developed creative approaches to land use regulation that are crafted with a goal of minimizing habitat fragmentation and protecting significant habitat features. These approaches include a full spectrum of common local planning topics such as:

- Road acceptance policies and dead-end road requirements that help to minimize intrusion into undeveloped habitat blocks, require that wetland and water crossings be designed to accommodate aquatic fish and invertebrate passage, and require curb designs that allows for reptile crossing.
- Transfer of development fee programs that allow developers to purchase additional development "credits" to be used in growth areas with fees purchasing land in designated conservation priority areas.
- Impact fee programs for open space that are collected at the time of development project approval based on units created and used to fund land acquisition priorities identified in open space plans necessary to satisfy public recreational access needs.
- Wetland buffer provisions that go beyond state minimum requirements and help to protect the local natural benefits provided by wetlands, streams and other water bodies determined to be locally significant.
- Wetland compensation requirements that fill the current state loop hole for unmitigated small wetland impacts and allow municipalities to recover and protect groundwater recharge, flood protection, and habitat functions provided by wetlands.
- Natural resource overlay districts that apply additional development performance standards to projects within the natural boundaries of a mapped resource such as an aquifer, forest block, or local focus area.
- Net residential density calculation approaches that subtract significant habitat resources from lot number determinations.
- Subdivision design approaches that include provisions for open space that directly respond to habitat connectivity needs.

BEN KIMBALL

Purple pitcher plant (*Sarracenia purpurea*).

The Beginning with Habitat on-line tool box (**www.beginningwithhabitat.org/toolbox.html**) attempts to compile the most current approaches to effectively guiding rural growth as developed by Maine communities. Local planners are encouraged to contact Beginning with Habitat staff with their ideas for new tools, or for assistance in identifying tools that may be appropriate to address local needs.

In Maine, it is critical that any local zoning, subdivision, or other regulatory tool be authorized in some manner by the comprehensive plan of your town. Many towns form an implementation committee to make any necessary revisions to local regulations. Towns can consider a number of different resource protection options using their local ordinance powers. Three examples follow.

1. Require Focus Areas to be part of Subdivision or Site Plan Review process.

When a proposal potentially conflicts with a mapped rare plant or rare or exemplary natural community, require provisions in local ordinances for a botanical review by ecologists at the Maine Natural Areas Program (207-287-8044).

When a proposal potentially conflicts with a mapped animal occurrence, significant wildlife habitat, or essential wildlife habitat, require provisions in local ordinances for review of development applications by the Maine Department of inland Fisheries and Wildlife Region A office in Gray, Maine (207-657-2345) .

Towns might also be concerned about the regional implications of development within Conservation Focus Areas, as most of these areas cross town borders. To address this, municipalities can include language in the town subdivision ordinance that requires inter-municipal review of developments when focus area resources are or may be impacted. This does not present an onerous requirement for applicants and can put everyone on immediate notice that critical local and regional natural resource issues are involved. The text below provides a sample of what that language might look like:

> Within three days of the receipt of the Preliminary Plan application, the Board, or its designee, shall:
>
> 1. Issue a dated receipt to the applicant.
> 2. Notify in writing by First Class Mail all owners of abutting property that an application for subdivision approval has been submitted, specifying the location of the proposed subdivision and including a general description of the project.
> 3. Notify the clerk and the review authority of the neighboring municipalities if any portion of the subdivision abuts or crosses the municipal boundary.
> 4. When any portion of a subdivision is located within a Conservation Focus Area mapped in the April 2010 Land Conservation Plan for Maine's Piscataqua Region Watersheds, the municipal reviewing authority in which it is located shall notify by mail all other municipalities within the focus area specifying the location of the proposed subdivision and including a general description of the project. The municipal reviewing authority shall invite comments from the surrounding towns regarding such application.

2. Consider Adopting Shoreland Zoning Standards that are more stringent than the DEP Minimum Guidelines.

Communities are enabled to strengthen the Maine Department of Environmental Protection (DEP) Minimum Shoreland Guidelines for areas in the community that are worthy of additional protections. Many towns have used Shoreland Zoning to strengthen the restrictions around wetlands (such as regulating smaller wetlands), protecting first order streams, and expanding setbacks for some rivers, ponds and other water bodies. If additional regulation is potentially a delicate political issue, an important consideration is to only extend additional shoreland protections within the focus area regions (or if you have adopted these focus areas as critical rural zones). For instance, a town might consider protecting first order streams in the focus areas or provide for additional setbacks beyond the 75 foot minimum for normal stream protection.

3. Adopt Conservation Zoning.

A number of different zoning techniques may be employed to conserve natural resources even as development takes place. Adopting a Conservation Overlay District that applies to the mapped CFAs is one way that towns can better protect the integrity of the CFAs while still allowing carefully planned development. There are two model ordinances in the Appendices that can be used as templates for towns to adopt in order to create an effective Conservation Overlay District for CFAs. Two different model ordinances are provided so that any given town can choose the model which best suits their community. Also included is a model Conservation Subdivision ordinance that provides practical guidance on protecting wildlife attributes of a land parcel proposed for subdivision development (Appendix F). The model ordinances are useful tools that towns can use to better protect the water resource and wildlife hot spots of exceptional value within their town, and can be specifically tailored to the unique circumstances of each community.

IMPLEMENTATION STRATEGY #7: RAISE REVENUES FOR LOCAL LAND CONSERVATION

An important component of any local land acquisition strategy is raising funds on the local level, which might be used for outright purchase of conservation lands by the community or to assist other groups (such as land trusts, statewide organizations and other non-profits) in the effort. Over the past few years some southern Maine communities have become more active in raising funds for these purposes. Here are a few examples of fundraising mechanisms.

Impact Fees for Conservation

Impact fees for conservation have been successfully used in the region by both Saco and North Berwick to raise revenues for open space acquisition not only by the town itself but as a source of matching funds for projects being pursued buy other conservation organizations. MRSA Title 30-A, Section 4354, specifically enables communities to design and implement a system of impact fees for park lands and open space.

These fees need to be placed in a dedicated account for conservation. However, they may be used for a variety of purposes (these are dictated by the enabling town ordinance so it is important to provide clear guidance when drafting rules). Having an open space plan or formalizing an open space prioritization process would be helpful before or after the fee has been put in place. This helps answer questions about what such a fee might be used for. Due to the amount of money required for conservation in southern Maine it is most likely the funds will be used in coordination with land trusts, groups such as the Nature Conservancy, or as part of a Land for Maine's Future Program purchase.

The development of the ordinance language and the actual fee amount requires some research and analysis. The methodology for determining the fee is perhaps the more critical and difficult part of the effort. The Southern Maine Regional Planning Commission (SMRPC) has helped a few communities with the fee calculation. If you are interested in an impact fee and need assistance please contact SMRPC. Examples of impact fee for conservation ordinances for several Maine communities can be found at **www.beginningwithhabitat.org/toolbox/finance_impactfee.html.**

Development Transfer Overlay District

A Development Transfer Overlay District is an effective mechanism to raise revenue for conservation while also promoting the principles of increased density and smart growth. These districts are currently being used in Gorham, New Gloucester, and Saco. The ordinance works somewhat like a density bonus with a fee attached. It is particularly appealing to some towns as it is not as complicated as a Transfer of Development Rights program nor as contentious as developing and instituting an impact fee. The ordinance can be effective in raising money for conservation in exchange for added density in so called "growth areas." The fees are then used to purchase land in rural parts of town – which in this case might involve Conservation Focus Areas.

Towns wishing to employ this model have some factors to consider. First, the premise of this ordinance should be laid out and approved in the town's Comprehensive Plan. Secondly, it is helpful to have an open space plan, a list of priorities for conservation, or to use this plan and the mapped and described focus areas as possible targets for the use of the fee. It is important to be able to describe to the public – at least in general terms – municipal priorities for the use of the dedicated funds.

Model Municipal Freshwater Wetlands Ordinance

The model for a Municipal Freshwater Wetlands Ordinance, developed by the Maine State Planning Office (SPO) is designed to provide Maine communities with a tool to reduce the impacts of wetland losses from land use activities. It addresses the cumulative impacts resulting from small wetland alterations, which, although regulated by the Maine Department of Environmental Protection (DEP), are not presently subject to compensation requirements under state law or regulation. In other words, although small impacts to wetlands result in direct losses and incremental degradation of the functions performed by those wetlands, such as flood protection, runoff filtration, and habitat values, there are no requirements to replace those lost functions. The loss of ecological services performed by wetlands at the local level translates to direct economic costs for the community when artificial remedies are necessary to replace these services.

These small wetland losses can add up. DEP regulations generally do not require compensation for wetland alterations involving less than 15,000 square feet of disturbance unless the alterations occur in wetlands defined by the regulations (DEP Rule 310) as wetlands of special significance (refer to **www.beginningwithhabitat.org/toolbox/wetlands_slz.html**). Over half of all wetland alterations regulated by the state involve less than 15,000 square feet, and cumulatively these wetland alterations amount to over 25% of the total wetland losses from regulated wetland activities (Wetland Regulation Under the Natural

Resources Protection Act (NRPA): Program Overview 2002, Maine DEP and Maine State Planning Office).

This model ordinance addresses wetland alterations that are regulated by the state but not required to provide compensation. These alterations include activities that disturb at least 4,300 square feet (current NRPA permitting threshold for lower value wetlands) and up to 15,000 square feet of wetlands. This model minimizes the need to invent new standards and processes for reviewing wetland alteration projects by "piggy-backing" onto the standards and application procedures of the DEP Natural Resources Protection Act (NRPA). This ordinance adopts by reference the standards and guidelines contained in the NRPA and the DEP rules developed through the authority provided to it in the NRPA (Chapter 310: Wetlands and Waterbodies Protection Rules; and Chapter 305: Permit by Rule). For simplicity and to avoid duplication of application effort, this ordinance is designed to accept the NRPA application as the application for a Wetlands Permit at the local level. Lastly, and most fundamentally, it accepts a permit granted by the DEP as meeting its wetland objectives for all intents and purposes except for compensating for (and therefore minimizing) cumulative wetland losses from small-scale wetland alterations. By accepting DEP rulings on permits, the ordinance does not require the municipality to have technical review capacity beyond what would be offered by a Code Enforcement Officer, Planner or Planning Board. The purpose of this model is to add a final level of review at the local level in order to achieve additional wetland compensation for small-scale projects

The municipalities of Kittery, Falmouth, and South Portland have all developed their own local version of a Wetlands Mitigation Ordinance. For additional information go to: **www.beginningwithhabitat.org/pdf/model_wetlands.pdf**

REFERENCES

Cameron, D., 2002. *An Ecological Assessment of the South Coastal and Southwestern Interior Regions of Maine*. Maine Natural Areas Program.

Cronon, William. 1983. *Changes in the Land: Indians, Colonists and the Ecology of New England.* Hill & Wang, New York. 242 pages.

Maine Department of Environmental Protection and Maine State Planning Office. 2002. Wetlands Regulation Under the Natural Resources Protection Act: Program Overview 2002. **www.mainewetlands.org/2002finallegrpt1.pdf**

PREP, 2009. *State of the Estuaries 2009.* Technical Report. Published by the Piscataqua Region Estuaries Partnership, Durham, NH.

US Census Bureau, 2000. *Profile of General Demographic Characteristics: 2000.* **http://factfinder.census.gov/home/saff/main.html.**

APPENDIX A
LAND CONSERVATION PLANS AND LAND CONSERVATION PARTNER ORGANIZATIONS IN MAINE'S PISCATAQUA REGION

EXISTING CONSERVATION PLANS IN THE MAINE PISCATAQUA REGION

Great Works Regional Land Trust, *Piecing together the Puzzle: Farms, Forests and Water*, 2009, Ogunquit, Wells, the three Berwicks, and Eliot, 52 pp.
www.gwrlt.org

Mt. Agamenticus Conservation Initiative, *Conservation Plan*, 2005, York, Eliot, South Berwick, Wells, and Ogunquit, 18 pp.
www.mta2c.org/mta2c_conservation_plan.pdf

Town of Sanford, *Headwaters; A Collaborative Conservation Plan for the Town of Sanford*, 2009, 51 pp.
http://tos.wwwbus.metrocast.net/ConservationPlan/Sanford Conservation Plan Draft 206-1.pdf

Note: Open space plans are currently in progress in Kittery, Eliot, and South Berwick.

MUNICIPAL CONSERVATION COMMISSIONS AND COMMITTEES

Eliot Conservation Commission
1333 State Road
Eliot, ME 03903

Kittery Conservation Commission
200 Rogers Rd Ext.
Kittery, Maine 03904

North Berwick Conservation Commission
21 Main Street, PO Box 422
North Berwick, ME 03906

Sanford Conservation Commission
919 Main Street
Sanford, ME 04073

Sanford Trails
www.freewebs.com/sanfordtrailcommittee/
The Sanford Trail committee is a volunteer committee within the town government working on developing recreational trails in town.

South Berwick Conservation Commission
180 Main Street
South Berwick, ME 03908

Wells Conservation Commission
Wells Town Hall
PO Box 398
Wells, ME 04090
www.wellsconservation.org
The Wells CC created the 600+ acre Fenderson Commons on the town border with Sanford and a Land Bank Fund through the town's capital improvement budget process.

York Conservation Commission
186 York Street
York, ME 03909

LAND TRUSTS

Kittery Land Trust
PO Box 467
Kittery, ME 03904

Sanford-Springvale Mousam Way Land Trust
14 Park Street
Sanford, ME 04073
PHONE: 207-324-5609
EMAIL: drbud1@metrocast.net
Conserves natural resources, unique historical and scenic sites, dams, roads, trails and areas of agricultural, economic or educational significance in Sanford and Springvale.

Three Rivers Land Trust
PO Box 906
Acton, ME 04001
EMAIL: info@3rlt.org
www.3rlt.org
Works with landowners to conserve natural resources such as lakes, rivers, streams, wetlands, agricultural lands, woodlands, historic sites, scenic places and wildlife habitat. Operates in Acton, Alfred, Lebanon, Sanford/Springvale, and Shapleigh.

York Land Trust
PO Box 1241, US Route 1
York Harbor, ME 03911
PHONE: 207-363-7400
EMAIL: info@yorklandtrust.org
www.yorklandtrust.org

Maine Coast Heritage Trust
Christina Epperson
Bowdoin Mill
1 Main Street
Topsham, Maine 04086
PHONE: 207-729-7366
EMAIL: info@mcht.org
www.mcht.org

The Mt. Agamenticus to the Sea Conservation Initiative
Post Office Box 151
South Berwick, Maine 03908
Office Location: 610 Main Street,
Ogunquit, ME 03907
PHONE: 207.646.3604
FAX: 207.646-3604

OTHER ORGANIZATIONS

Piscataqua Region Estuaries Partnership
University of New Hampshire
Nesmith Hall, 131 Main Street
Durham, NH 03824-2601
PHONE: 603-862-2641
www.prep.unh.edu
PREP is a collaborative watershed management program that monitors, protects, and restores the Great Bay and Hampton-Seabrook estuaries.

Southern Maine Regional Planning Commission
9 Bradeen St. Suite 400
Springvale, ME 04083
PHONE: 207-324-2952
www.smrpc.org

Wells National Estuarine Research Reserve
342 Laudholm Farm Road
Wells ME 04090
PHONE: 207-646-1555
EMAIL: tsmith@wellsreserve.org
www.wellsreserve.org

York County Soil and Water Conservation District Anderson Learning Center
21 Bradeen St, Suite 104
Springvale, ME 04083
PHONE: 207-324-0888 x 214
EMAIL: info@yorkswcd.org
www.yorkswcd.org
Provides technical, educational, and financial resources to land users in York County to promote quality of life, stewardship and wise use of our natural resources, and ensure the viability of the agricultural sector.

The Nature Conservancy
Barbara Vickery
Fort Andross, Suite 401
14 Maine Street
Brunswick, Maine 04011
PHONE: 207-729-5181
EMAIL: bvickery@tnc.org
www.nature.org

MAINE NATURAL RESOURCE AGENCIES

Maine Department of Inland Fisheries & Wildlife Beginning with Habitat Program
Steve Walker, Manager
41 State House Station
284 State Street
Augusta, Maine 04333-0041
PHONE: 207-287-5254
FAX: 207-287-6395
EMAIL: steve.walker@maine.gov
www.beginningwithhabitat.org

Maine Department of Inland Fisheries & Wildlife
Region A - Gray Maine
RR1, 358 Shaker Road
Gray, ME 04039
PHONE: 207-657-2345

Maine Natural Areas Program
Molly Docherty
17 Elkins Lane
93 State House Station
Augusta, ME 04333-0093
PHONE: 207-287-8044 / 207-287-8046
FAX: 207-287-8040
EMAIL: maine.nap@maine.gov

Maine State Planning Office
Elizabeth Hertz
184 State Street
38 State House Station
Augusta, Maine 04333-0038
PHONE: 207-287-8061; 1-800-662-4545
EMAIL: elizabeth.hertz@maine.gov
www.maine.gov/spo

APPENDIX B

ANALYSIS OF HOW TOWN COMPREHENSIVE PLANS AND OPEN SPACE PLANS ALIGN WITH CONSERVATION FOCUS AREAS

Town	Rank: Most similar to CFAs	Implementation Strategy: Priority Next Steps	Open Space Plan Status	Open Space Plan: Address similar areas	Comprehensive Plan Status	Comprehensive Plan Future Land Use Map: Address similar areas	Existing Zoning: Implemented Future Land Use Plan	Existing Zoning: Address similar area	Conservation Easement within Conservation Focus Areas	Conservation Commission
Sanford	1	2, 5, 6, 7	Adopted	Overlap 90% of Tier 1 & 2 areas with Priority Open Space areas. A portion of the Merriland River Wetlands and Bauneg Beg Mountain Tier 2 areas is not identified as priority areas.	Adopted/ Consistent 2005	Future Land Use Map designates rural, low-density, land use areas overlapping Tier 1 and 2 areas.	Implemented latest Future Land Use Plan.	All Tier 1 and 2 areas are zoned either Rural Residential or Rural Mixed Use, with the exception of a small portion of the Tier 1 Sanford Ponds area which is zoned Single Family Residential a growth area zone.	Relatively few conserved lands in Tier 1 and 2 areas.	Yes
North Berwick	2	2, 5, 6, 7	Open Space and Recreational Needs Analysis was completed in 2003.	All subdivisions required to pay a development impact fee to fund Open Space needs.	Adopted/ Consistent 2008	All of Tier 1 areas are overlayed by Critical Rural land use areas with a recommended 6-acre minimum lot size. A small portion of Tier 2 Beaver Dam Heath is overlayed by Residential II growth area.	Future Land Use map not implemented.	Current Farm and Forest zone overlaying Tier I areas.	Conservation Easements within the Tier 1 Bauneg Beg Mountain area.	Yes
Eliot	3	2, 5, 6, 7	In progress	N/A	Adopted/ Consistent 2009	Critical Rural and Rural land use designation overlapping Tier 1 areas. Tier 2 areas overlapped by Suburban land use designation, which is considered a growth area.	Latest Future Land Use Plan not implemented.	Rural land use designation overlapping Tier 1 areas. Tier 2 areas overlapped by Suburban and Commercial/ Industrial growth area zones.	Some scattered conservation areas within Tier 1. Relatively few conservation areas within Tier 2.	Yes
Acton	4	2, 4, 5, 6	None	N/A	Adopted/ Consistent 2005	Critical Rural or Rural land use designation overlapping nearly 100% of both Tier 1 and 2 areas.	Implemented future land use plan.	Adopted Critical Rural zone (5 ac. min. lot size) which requires cluster subdivisions with 50% open space. Recently amended Rural zoning from 3 ac. min. lot size to 2 ac.	Small conservation parcel in Tier 2 South Acton Swamps area. Large parcels of tree growth current use in Tier 2 areas.	No
South Berwick	5	2, 4, 5, 6	None	N/A	Adopted/ Consistent 2007	The entire Tier 1 Mt. A and York River Headwaters area is designated as Rural 3, 4, or 5.	Future Land Use map implemented.	The entire Tier 1 Mt. A and York River Headwaters area is designated as Rural 3, 4, or 5.	About 1,500 ac. within the south eastern corner of South Berwick is in conservation.	Yes

Town	Rank: Most similar to CFAs	Implementation Strategy: Priority Next Steps	Open Space Plan Status	Open Space Plan: Address similar areas	Comprehensive Plan Status	Comprehensive Plan Future Land Use Map: Address similar areas	Existing Zoning: Implemented Future Land Use Plan	Existing Zoning: Address similar area	Conservation Easement within Conservation Focus Areas	Conservation Commission
York	6	2, 4, 5, 6	No	N/A	Partially adopted, not reviewed for consistency.	Rural Area land use designation for all Tier 1 and 2 areas.	Latest Future Land Use Plan not implemented.	GEN-1 zone (3 ac. minimum lot size) overlaying Tier 1 area. RES 1-A (2 ac. minimum lot size) overlaying Tier 2 Passaconway Pond area.	Significant amount of conservation easements within Tier 1 area.	Yes
Wells	7	2, 4, 5, 6	None	N/A	Adopted/ Consistent 2005	Critical Rural, Rural, Resource Protection, or Aquifer Recharge Area land use designations overlap almost 100% of Tier 1 and 2 areas.	Future Land Use map not implemented.	Most of the Tier 1 and 2 areas are zoned Rural. Some land within Tier 1 Mt. A and York River Headwaters area and Tier 2 Webhannet River Wetlands areas along Highway 9B are zoned a higher-density RES A. A portion of Tier 2 Webhannet River Wetlands area is zoned Light Industrial.	Approx 40% of Tier 1 & 2 is in conservation, with another 40% in tree growth or farm current use status.	Yes
Kittery	8	2, 4, 5, 6	None	N/A	Adopted /Consistent 2001	About 75% of the Tier 1 Brave Boat Harbor and Gerrish Island area is designated Resource Conservation. This area includes Gerrish Island and the coastal mainland east of Route 103. The land area northwest of Route 103 is designated Kittery Point Village which is a growth area.	Partially implemented.	The zones are similar to the Future Land Use Map in the Conservation Plan with about 75% of the Tier 1 Brave Boat Harbor and Gerrish Island zoned Rural Conservation, while the northwest portion is zoned Kittery Point Village.	A considerable amount of land is in conservation status within the northern half of the Tier 1 Brave Boat Harbor and Gerrish Island area, along with the southern tip of Gerrish Island.	Yes
Berwick	9	2, 4, 5, 6	None	N/A	Adopted/ Consistent 2002	All areas are designated rural, with the exception of the western portion of the Tier 2 Cranberry Meadow area which is designated a residential growth area.	Future Land Use map implemented.	All areas are zoned Rural 4, with the exception of the western portion of the Tier 2 Cranberry Meadow area which is zoned Rural 2, a transitional growth area.	A few scattered parcels within the Tier 1 and 2 areas are in conservation.	No
Lebanon	10	1, 2, 3	None	N/A	Adopted 1991	Not applicable. Comprehensive Plan is outdated.	Not applicable since Comprehensive Plan is outdated.	No zoning districts established beyond shoreland zoning.	Almost the entire eastern half of Lebanon is part of the Tier 2 little River East area. About 20% of this area is in conservation.	No

APPENDIX C

THE EXPERT STAKEHOLDER PROCESS AND GIS-BASED CO-OCCURRENCE MAPPING ANALYSIS USED TO IDENTIFY CONSERVATION FOCUS AREAS

EXPERT STAKEHOLDER PROCESS

The process leading to the identification of the Conservation Focus Areas recognized in this plan was guided by an expert stakeholder panel. This panel was specially convened for this project and had two primary roles in the development of this conservation plan:

1. Evaluate the available natural resource and wildlife spatial data available for the region and determine the relative importance that different data layers should be assigned within the GIS co-occurrence modeling process.
2. Provide quality control on the model output results by ensuring that priority Conservation Focus Areas identified by the modeling process reflect known local conservation "hot spots" within the region, and that the weighting factors assigned to model inputs produce logical and meaningful results.

Expert opinion to weight (i.e., score) the different spatial data layers utilized in the GIS co-occurrence model was deemed necessary since some landscape/habitat attributes are more important than others from a conservation biology standpoint, and thus should carry more weight in determining the scores of individual pixels in the GIS co-occurrence analysis. Data layers used for the project, as well as their relative weighting in the co-occurrence model, were driven by well accepted principles of landscape conservation biology. These principles recognize the importance of landscape elements such as connectivity between habitat patches, core protected areas with buffer zones, large unfragmented areas, preservation of rare species/habitats, capacity for population/landscape resilience to disturbances, species range considerations, and representation of a broad spectrum of habitat types. Given their critical importance to protecting water quality, riparian (shoreland) buffers were given special attention in the weighting and modeling process.

The expert stakeholder process utilized during the development of this conservation plan was closely modeled on the process used during the development of The Land Conservation Plan for New Hampshire's Coastal Watersheds, which identified Conservation Focus Areas in the New Hampshire portion of the Piscataqua Region (Zankel *et al.* 2006). The process involved convening a panel of eleven expert natural resource professionals, community planners, and land conservation professionals knowledgeable about regional wildlife habitat and water quality issues, and leading them through a facilitated process to collectively score each of the data input layers for the GIS model. At the first meeting of this group, each environmental data source that was suitable for the GIS analysis was discussed in detail so that all experts clearly understood the source and quality of the data, spatial coverage, collection methodology, strengths, and limitations of the data. The thirty data layers used in the GIS co-occurrence model are listed in Table C-1.

Once each participant was clear on the data input factors, they then utilized a computerized tally sheet to assign scores to each data layer as an indicator of its relative importance as a factor in the identification of the highest priority areas for land protection. Each expert was provided with a total of 100 points, which they were free to allocate among the thirty different data layers as they deemed appropriate. The individual score sheets were then electronically tallied into a master sheet that indicated the group mean score as well as the range of values (minimum, maximum) selected by individuals. The mean value for each data layer is used in the GIS co-occurrence model to weight that layer relative to others in the model, thus displaying the average or shared vision of the group cartographically. This scoring process was completed during the first expert

FIGURE C-1. DATA FACTORS USED IN CO-OCCURRENCE MODEL

BwH MAP 3 RESOURCES (with # of habitat units identified in parenthesis)
UNDEVELOPED HABITAT BLOCKS
200-800 acres (97)
800-1400 acres (47)
>1,400 acres (30)
UNFRAGMENTED FOREST BLOCKS
500-800 acres (26)
800-1500 acres (11)
>1,500 acres (8)
BwH MAP 1 RESOURCES
RIPARIAN ZONES
Coastal Wetland 250-foot buffer
River 250-foot buffer
Great Pond 250-foot buffer
Wetlands >10 acre 250-foot buffer
Wetlands <10 acres + 75-foot buffer
Streams 75-foot buffer
BwH MAP 2 RESOURCES
SIGNIFICANT WILDLIFE HABITATS
Inland Wadingbird Waterfowl Habitats (with 250-foot buffer)
Tidal Wadingbird Waterfowl Habitats (with 250-foot buffer)
Seabird Nesting Islands
Deer Wintering Areas
Significant Vernal Pools (with 500-foot buffer)
Shorebird Feeding Area + 100-foot buffer
Shorebird Roosting + 250 feet
RARE SPECIES
Endangered Animal Occurrence (with 1/4-mile buffer)
Threatened Animal Occurrence (with 1/4-mile buffer)
Special Concern Animal Occurrence (with 1/4-mile buffer)
S1 (Endangered) Plant Occurrence (with 250-foot buffer)
S1/S2 - S2 (Threatened) Plant Occurrence (with 250-foot buffer)
S2/S3 - S3 (Special Concern) Plant Occurrence (with 75-foot buffer)
USFWS PRIORITY TRUST SPECIES HABITAT
Top 25% combined
RARE AND EXEMPLARY COMMUNITIES
S1 (Critically Imperilled) Natural Community + 250-acre buffer
S2 (Imperilled) Natural Community + 250-acre buffer
S3 (Rare) Natural Community + 250-acre buffer
A or B Rank Exemplary Community + 250-acre buffer

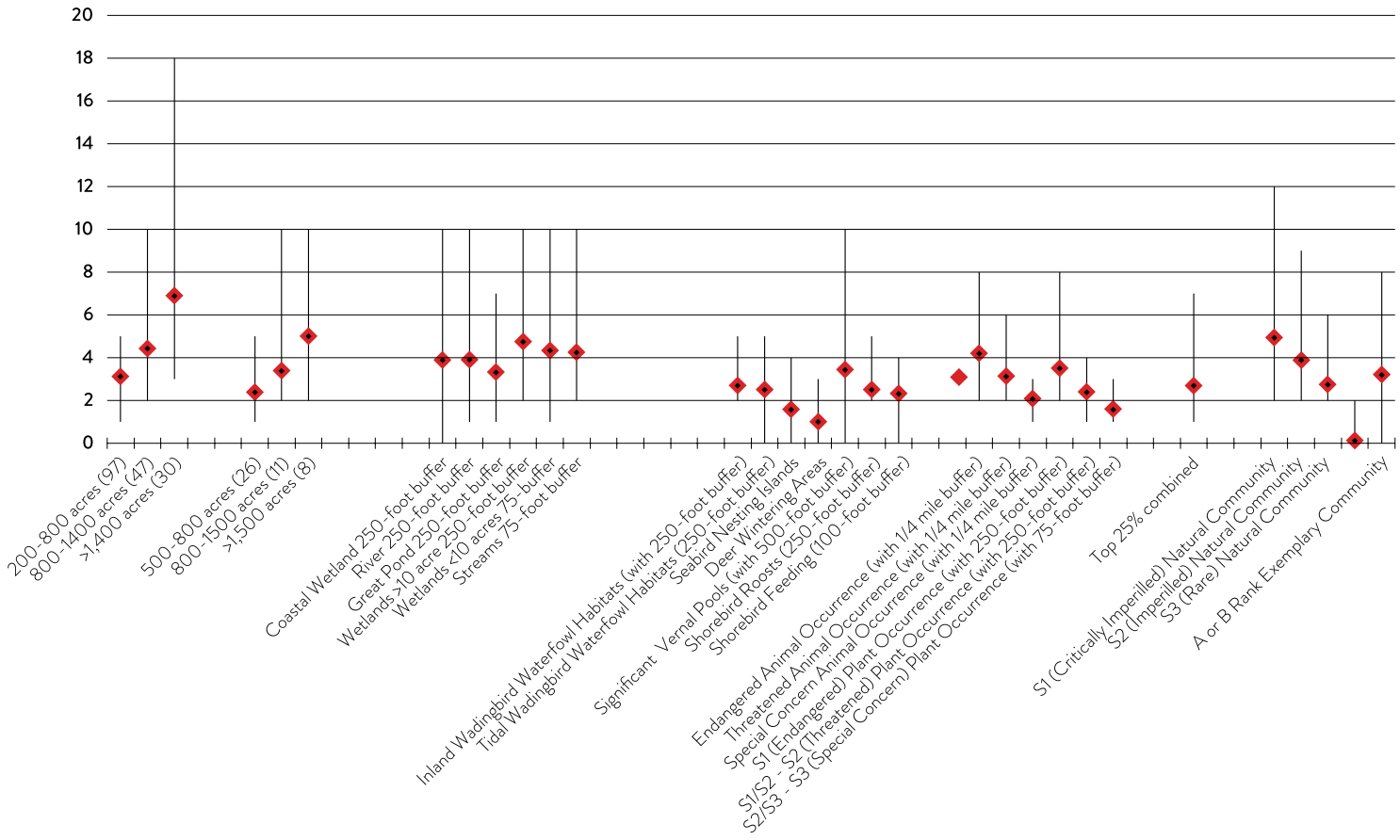
stakeholder meeting. The scoring results are shown in Figure C-2. Once the individual scores were tallied, the group had a chance to review and discuss the collective results. Individuals were then provided with the option to modify their scores based on any new insights.

Even with the significant variation among individual scoring allocations, the collective results show several notable characteristics:

- larger blocks of unfragmented and undeveloped lands were valued more highly than smaller blocks;
- wetland and waterway buffers of all kinds were consistently highly valued; and
- rare species and imperiled natural community types were highly valued, with the value directly related to how endangered the species or community is (the more rare the occurrence the more weight it should be given for protection).

The weighting scores developed by the group were applied to the data layers in the GIS co-occurrence model, and ultimately affected the composite scores of individual pixels. At the second expert stakeholder meeting the draft model output (in the form of composite score maps) was brought back to the group in order to check the results. The group worked with the GIS analyst to define appropriate scoring thresholds to roughly define the boundaries of the Conservation Focus Areas (CFA). The group also agreed that it made sense to define Core Areas and "Supporting Natural Landscapes" for each CFA. Supporting Natural Landscapes are lower scoring natural areas adjacent

FIGURE C-2. EXPERT STAKEHOLDER WEIGHTING SCORES FOR GIS DATA LAYERS



to high-scoring core focus areas that serve to buffer and connect the high-scoring components of the areas. The group confirmed that the output results identified the key conservation hot spots that they were aware of, as well as identifying new areas as supported by the rich data inputs that had not been evaluated cumulatively in this manner previous to this analysis.

One concern raised by the group was that the first model run provided the same weighting to riparian areas regardless of their condition (i.e. developed or undeveloped). Based on the value of intact riparian areas to water quality and wildlife, additional analysis was thought warranted to make sure the model reflected the importance of these areas. This issue was addressed in subsequent model runs by creating a new GIS layer that identified stream reaches within undeveloped habitat blocks greater than or equal to 100 acres and providing additional weighting to all of the resulting polygons. Thus, riparian habitat in larger undisturbed blocks is accounted for in the final model results.

APPENDIX D
MODEL LAND CONSERVATION OVERLAY DISTRICT (OPTION I)

I. Purposes: The purposes of this ordinance are:

A. Protect regional and municipal water quality of aquifers, private and public water supply wells, and surface water

B. Maintain ecological functions and natural ecosystem services necessary to sustain a healthy environment at the global, regional, and local levels such as:

1. Climate regulation: carbon sequestration, or the capture and storage of carbon dioxide by forest and other plant cover, reducing global warming
2. Freshwater regulation and supply: the storage, control, filtration, and recharge of water supplies by forests and wetlands which assist in maintaining the quality and integrity of drinking water supplies
3. Nutrient cycling: the passage of nutrients, such as nitrogen, through the ecosystem for usage by plants, reducing the need to apply fertilizers
4. Nutrient uptake and waste assimilation: the filtering of pathogens and nutrients from runoff by forests, vegetated buffers and wetlands, reducing the need for water treatment systems
5. Flood retention: the temporary storage of water from storms in areas provided by wetlands and marshes, reducing damage to real property and municipal infrastructure such as roads and bridges
6. Habitat protection: contiguous patches of forest and wetland and other habitat types support a diversity of plant and animal life that contribute to versatility and long-term health of food supply and ecosystem as a whole
7. Soil Retention and formation: creation of new soils and prevention of erosion, reducing the need for dredging and mitigation of damage due to siltation of rivers and streams
8. Recreation and Aesthetics: recreational activities and aesthetic value provided by the management and conservation of natural resources such as hunting, fishing, bird-watching, hiking, camping, canoeing, kayaking, and wildlife photography which contribute to the prosperity, rural character and welfare of the region and support the tourism and natural resource sectors of the economy

C. Regional Considerations: incorporate regional considerations into local planning and decision making so as to ensure consideration of regional needs and the regional impact of development, pursuant to MRSA 30-A, Section 4312.2.D

II. Applicability

A. Area of applicability. The Area of the Conservation Overlay District for the Town of [_____] is identified by the map for the Town of [_____] entitled "Conservation Overlay District" and subsequent amendments. The District includes the following elements:

1. **Focus areas contain Core Areas and Supporting Landscape Areas** as defined in the Land Conservation Plan for Maine's Piscataqua Region Watersheds
2. **Other Locally Defined Priority Protection Areas** [*these would include areas that have been identified by a preexisting local, watershed, or regional level plan that meet the purposes defined in this ordinance*.]

(NOTE: *Zones that a town may wish to exclude based upon the Comprehensive Plan may include Commercial, Industrial, or Town Center Zones. Towns adopting this ordinance may wish to add to and/or exclude areas from the Conservation Overlay Zone*

based on existing zoning or future land use intentions as expressed in the Town's Comprehensive Plan. However, a town may also choose to amend its Comprehensive plan and zoning configuration based upon the finding that a particular zone may contain one or more focus areas as designated by the Coastal Land Conservation Plan maps. Areas added might include priority conservation areas identified by the town, provided they are consistent with the purposes of this ordinance.)

B. Residential Subdivisions. The following regulations apply to all applications for subdivision within the Conservation Overlay District.

(NOTE: The following section should be included only if the Town has or expects to implement a transfer of development credits ordinance.)

C. Voluntary Transfer of Development Credits. Participation in the voluntary transfer of development credits program shall be available to all landowners proposing a subdivision development.

III. Dimensional Standards

A. Overall density. Density shall be calculated by determining the number of acres containing Core Areas and Supporting Landscape Areas as defined in the Land Conservation Plan for Maine's Piscataqua Region Watersheds and the number of acreage outside of these areas in proportion to the total area of the parcel as follows:

1. **For acreage containing Core Areas**, the recommended overall density shall be one unit per _____ acres. *(We recommend five to ten acres).*
2. **For acreage containing Supporting Landscape Areas**, the overall density shall be one unit per three to five acres.

   (NOTE: it is recommended that the Town determine an overall density within the above ranges based on consideration of both the particular Core Areas and supporting landscape areas as depicted on the Conservation Plan for Maine's Piscataqua Region Watersheds *map set as well as a site-level assessment of the natural resources. A licensed natural resource professional should be retained to evaluate the site and recommend a range of density appropriate for the carrying capacity of the particular resources on site necessary to sustain the ecological function of the particular resources identified.)*

3. **Maximum density.** In no case shall the overall density for a particular parcel be greater than the lowest allowable density for the parcel were it not identified as containing a Focus Area or Supporting Landscape Area.

B. Site Development Area. No more than 20 percent of the overall site acreage configured in a contiguous area may be developed unless the proposed development avoids all acreage containing Core Area and Supporting Landscape area. The following density proportions shall apply based on the natural resource characteristics of the parcel:

1. **For parcels in which all of the land area is within a Focus Area,** no more than 10 percent of the site may be developed
2. **For parcels in which all of the land area is within a Supporting Landscape Area**, no more than 20 percent of the overall site may be developed
3. **For parcels in which some of the land is within a Core Area, some of the land is within a supporting Landscape Area**, and some of the land is in neither area, if the development does not include any Core Area or Supporting Landscape Area acreage within the developed portion of the site, up to 70 percent of the site may be developed.
4. **For portions of the development that are within Core Areas**, no more than 10 percent may be developed. For portions of the development that are within Supporting Landscape Areas, no more than 20 percent may be developed.

C. Variable lot sizes permitted. Variable lot sizes shall be permitted, but all lots must be designated by lot lines. No single lot shall be less than that required to reasonably accommodate the dwelling unit and any necessary utilities, including wells and septic except where community wells or septic systems. Community septic systems shall be located outside of the Conservation Focus Areas.

D. Riparian Buffer and Setback Requirements for Wildlife Habitat Areas and Water Quality. Any lot that includes riparian wildlife habitat area as designated by Maine Department of Inland Wildlife and Fisheries must buffer that riparian habitat area by delineating a 250 foot buffer. Any lot that contains or borders a river or any type of stream as

shown on a USGS 7.5 Series Map but does not include riparian wildlife habitat area must delineate a 100-foot buffer for water quality protection. Buffers shall be designated as no cut no disturb by permanent markers or signage.

Conservation Area Calculation

E. Area of Development: All development density to include roads, dwelling units, and other structures, but not to include septic systems and wells, must be located within 20 percent of the entire parcel. The remainder of the parcel shall be considered as conservation area and must comply with the following provisions for area, buildable area calculation, and ownership and management. Septic systems and wells may be located within the remaining 80 percent of the parcel but not within Core Areas.

F. Conservation Area: All developments shall have at least 50% (fifty percent) of the buildable upland area of the entire parcel designated as conservation land and documented through a permanent conservation easement within the deed for the parcel. Where significant wildlife habitat is identified through the four-step process above, the applicant shall also submit a wildlife management plan for the conservation land prepared by a natural resources professional and reviewed, at the applicant's expense, by the town's consultant.

G. Buildable Area Calculation: The buildable upland area of a parcel is determined by subtracting from the acreage of the entire parcel the following: the area of the parcel that will be used for locations of housing, related structures and roads, steep slopes in excess of 15 percent, and poorly and very poorly drained soils.

H. Ownership and Management of Conservation Area: Deed and related documents must clearly state the conveyance of the conservation land to an appropriate ownership and/or management entity through the use of a conservation easement.

IV. Phasing and Regional Impact Provisions for Residential Subdivisions

A. Mandatory Phasing. Mandatory phasing will be required on all subdivisions consistent with Maine Department of Environmental Protection, Chapter 500 Stormwater Rules for soil disturbance requirements.

B. Performance Agreement. A Performance Agreement for the sequencing of the installation of roads and a schedule of completion of each phase may be required at the discretion of the Planning Board.

V. Uses allowed within the Conservation Overlay District

A. Performance Standards. Uses allowed within the Conservation Overlay District include those uses which meet the following criterion and the performance standards designed to maintain the ability of the natural resources found within the Core Areas and Supporting Landscape to provide the ecosystem services described in preceding sections.

B. Uses which require the use, storage, production or disposal of toxic or hazardous materials, including but not limited to volatile organic compounds, petroleum products, heavy metals, and radioactive materials as defined by the Maine Department of Environmental Protection are expressly prohibited. All other uses must meet the following criteria in order to be permitted within the District:

1. **Best Management Practices for Stormwater Management and Low Impact Development /On-Site Infiltration.** The site utilizes best management practices for stormwater management and low impact development as defined by Maine Department of Environmental Protection, including on-site infiltration.
2. **Fragmentation.** The use does not fragment forest blocks and other important wildlife habitat resources found within a Focus Area as identified on the District Map.
3. **Best Management Practices for management of animal waste**. The use must utilize EPA and MDEP defined best management practices for management of animal waste to minimize the potential for water source contamination.
4. **Building Footprint.** Building footprint size must be less than 14,000 square feet to minimize the amount of large areas of impervious surface and fragmentation of the landscape by large buildings and supporting municipal infrastructure.
5. **Dark Sky Standards.** All development must meet the standards of the International Dark Sky Association for full-cutoff lighting fixtures to reduce off-site impacts of lighting on nocturnal wildlife species and minimize the negative effects of light pollution.

VI. Preliminary Layout

A. Four-step Design Process. Any subdivision in the Conservation Overlay District shall be designed according to the following four-step process. Applicants shall submit four separate sketch maps indicating the findings of each step of the design process.

STEP ONE: IDENTIFY ALL POTENTIAL PRIMARY AND SECONDARY CONSERVATION AREAS

a) **Primary Conservation Areas.** The following elements must be identified in Step 1 as primary conservation areas. The developer should attempt to limit development in these areas to the extent feasible:

1. Areas Delineated as **Core Areas** by the District Map
2. Wetlands, Floodplains, and Steep Slopes

(NOTE: Towns may wish to include a provision identifying their existing Wetlands, Shoreline Protection and Floodplains Ordinances applicability to these resources)

3. Existing conservation lands or other lands permanently protected by conservation easements or under the management of a local or state Conservation Organization

b) **Secondary Conservation Areas.** The following areas must be identified as secondary conservation areas:

1. Areas Delineated as **Supporting Landscape** by the District Map
2. Areas identified for protection in the Municipality's Comprehensive Plan, Natural Resource Inventory, and in the State of Maine Department of Inland Fisheries and Wildlife Beginning With Habitat maps
3. Surface water areas including lakes, ponds, rivers, or streams and groundwater sources including aquifers and wells (*The applicant may reference local, regional, and state maps in identifying these areas.)*

The developer should limit development in secondary conservation areas by locating buildings, roads, and infrastructure so as not to fragment existing forest or other habitat blocks.

c) **Evaluation Criteria.** The subdivision shall be designed around both the Primary and Secondary Conservation areas. The Conservation Commission shall review and provide comments on the sketch and documentation produced by the developer in Step 1.

The Board shall consider the following criteria, if applicable, in evaluating the proposed layout of lots and open space: (*The Board may wish to develop a checklist to use in this section to evaluate the applicant's compliance, or may wish to set up the following criteria as performance standards*.)

- **Impacts of grading, filling, or construction**: The extent to which the design protect all floodplains, wetlands, and steep slopes greater than 15 percent from the impacts of grading, filling or construction.
- **Preservation of existing resources and buffers between residential and agricultural uses:** The extent to which the design preserve and maintain mature woodlands, existing fields, pastures, meadows, and orchards, and create sufficient buffer areas to minimize conflicts between residential and agricultural uses.
- **Location of houses:** If the development must be located on open fields or pastures due to development constraints on other parts of the site, the extent to which houses are sited on the least prime agricultural soils, or in locations at the far edge of a field.
- **Buffers for water quality and wildlife habitat:** The extent to which the layout maintains or creates an undisturbed upland buffer or natural native species vegetation of at least 100 feet in depth adjacent to wetlands and surface waters, including creeks, streams, springs, lakes, vernal pools and ponds, or 250 feet if the riparian area constitutes riparian wildlife habitat area.
- **Maintain existing treelines and large woodlands:** The extent to which the design considers existing treelines, and minimizes impacts in large woodlands, especially those containing significant wildlife habitat.

STEP TWO: LOCATE THE HOUSE SITES. The Board in evaluating the proposed application shall consider the following recommendations.

- Potential building sites shall be located taking into consideration the proposed common open space identified in Step 1 as well as other relevant data from the Site Inventory Plan and Site Analysis Map, such as topography and soils.
- Building sites must be located outside of Primary Conservation Areas and should be located outside of Secondary Conservation Areas to the extent feasible, taking into consideration the potential negative impacts of development on such areas as well as the potential positive benefits of such locations to provide attractive views and visual settings for residences and other uses.

STEP THREE: DESIGNING STREET ALIGNMENTS AND TRAILS. The Board shall consider the following criteria in evaluating the applicant's proposed design.

- Does the design minimize the amount of impervious surface by utilizing narrower roads if approved by the town's fire and safety officials, public works, and/or road commissioner?
- Does the design utilize low-impact development practices for stormwater management?
- Does the design incorporate wildlife crossings in areas of identified wildlife habitat and allow culvert sizing suitable for wildlife passage?

STEP FOUR: DRAWING THE LOT LINES

- Lot lines shall be drawn as required to delineate the boundaries of individual lots.

B. Environmental Assessment. Applicant must complete an environmental assessment of the area and/or reference the Town's natural resource inventory in the Town's Comprehensive or Open Space Plan. The assessment must be reviewed by a qualified natural resources professional such as a licensed forester, professional wildlife biologist or certified wetlands scientist retained by the town at the applicant's expense.

C. The following studies may also be required at the discretion of the Planning Board:

1. Aquifers/ hydrogeological study
2. High Intensity Soil Survey
3. Wetlands Inventory
4. Delineation of slopes greater than 15 percent

D. Minimize or Mitigate Negative Impacts. Applicant must demonstrate that the development will minimize or mitigate negative impacts of development during the construction phase through an erosion and sediment control plan.

E. Reclamation Plan. Applicant must provide reclamation plan and revegetation plan for any areas disturbed.

F. Wildlife Habitat. Applicant must provide a letter from the Maine Department of Inland Fisheries and Wildlife verifying the existence of wildlife habitat.

VII. Buffers for Riparian Area Specifications

A. Buffers for riparian wildlife habitat areas shall be 250 feet deep, vegetated, and designated as no cut no disturb by permanent markers or signage. Buffers for water quality shall be 100 feet deep, vegetated, and designated as no cut no disturb markers.

VIII. Wetlands Setbacks and Buffers Designation.

Setbacks and buffers may not be cut or disturbed except as specified in an approved Conservation Area Management Plan referenced in the provisions of the Conservation Easement. The Building inspector will certify by on-site inspection that the boundary of the buffer area has been marked with permanent markers or discs as described above.

APPENDIX E
MODEL WILDLIFE HABITAT OVERLAY DISTRICT (OPTION II.)

*[**Explanatory Note:** This example is not designed as a stand-alone ordinance. If a municipality chooses to incorporate the provisions of this ordinance into a comprehensive land use regulation ordinance, these provisions should be reviewed, amended, or omitted as may be necessary to ensure consistency, avoid redundancy, and to retain any provisions related specifically to project review.]*

Section I. General

A. Title: *Wildlife Habitat Overlay District for the (Town/ of City of [Municipality]).*

B. Authority

This ordinance is adopted pursuant to the enabling provisions of Article VIII, Part 2, Section 1 of the Maine Constitution; the provisions of Title 30-A MRSA Section 3001 (Home Rule), and the provisions of the Planning and Land Use Regulation Act, Title 30-A MRSA Section 4301 et seq.

C. Effective Date

This Ordinance takes effect on _____

D. Findings and Purposes

1. The purpose of the Wildlife Habitat Overlay district is to reduce the continuing loss of habitat for native species in designated portions of Conservation Focus Area (CFA) identified in the Land Conservation Plan for Maine's Piscataqua Region Watersheds, hereby termed the _____ district, while simultaneously accommodating development in the district.
2. The intent of the requirements of this section is to minimize the removal of woody vegetation that breaks large unfragmented blocks of forest habitat into smaller patches of forest; and to minimize activities that block or limit species movement between unfragmented blocks of forest. These activities are hereafter referred to as "fragmentation".
3. The Wildlife Habitat Overlay District includes the following
   a. Core Habitat Districts, are those portions of CFA that contain the primary natural features and habitat for which the CFA was designated, and;
   b. Supporting Habitat Districts, are the surrounding undeveloped lands that safeguard the Core Habitat District while also providing habitat for more common species

E. District Boundary

1. Geographic Coverage
The provisions in this section apply only to overlay districts depicted on the Town/City of [Municipality], Maine Zoning Map as "Wildlife Habitat Overlay Zoning Districts" on file in the Department of Planning/Codes Enforcement Office.

2. Boundary Determination
The overlay district boundaries are based on state resource agency data regarding rare, threatened, and endangered plant and animal species occurrences and supporting habitat types, state significant wildlife habitat designations, and areas of remaining unfragmented forest and other supporting habitat types. Boundary delineation was completed using the most recent available aerial photo imagery.

Section II. Requirements of the Overlay District

A. Applicability: This section shall apply to the following activities in the overlay districts:

1. Disturbance, as defined below;
2. New subdivisions;
3. Construction, enlargement or placement of a new building or structure;
4. Construction of a road, driveway, or parking lot;
5. Creation or expansion of commercial utility corridors;

B. Exempt Activities

The following activities do not pose a significant adverse impact on the environmental value of unfragmented blocks and corridors, and therefore do not require approval under this section of the ordinance. The standards of the underlying zone would continue to govern these activities where applicable:

1. Maintenance of existing hayfields and pastures
2. Standard farming activities at an existing establishment practicing agriculture, including but not limited to:
   a. the construction of traditional walls and fences for the purpose of enclosing existing livestock areas or delineating existing fields, pastures, crops, and garden plots
   b. construction or improvement of structures used for agriculture
   c. bush-hogging existing regenerating fields for agricultural purposes
   d. creation of utility lines and corridors directly associated with farm operations
   e. creation of impervious surfaces for the purposes of equipment and product storage, and access to existing agricultural facilities, fields and pastures.
3. Forest management activities including commercial woodlot management completed in accordance with Maine Forest Practices Act; harvesting of wood products for personal use, but not permanent clearing as defined below); and removal of dead, dying, and diseased trees. The removal of stumps, and grading conducted to limit natural regeneration of trees is not considered a forest management activity.
4. Structures constructed or placed on existing maintained lawns or impervious surfaces.
5. Permanent clearings within Supporting Habitat Districts less than 10,000 square feet in size.

   *[**Explanatory Note:** It is reasonable to consider an exemption window that would allow for creation of gardens, lawns, etc. The 10,000 square foot figure is currently used as a threshold in shoreland zoning rules.]*
6. The construction of one single-family residence and accessory structures on a lot that is created by a single division of an existing parcel and has frontage on a public road. The total area of disturbance in the overlay district on the parcel must not exceed 1 acre.

   *[**Explanatory Note:** This exemption is suggested as a mechanism to allow creation of a lot for a relative, or as a one time exemption allowing long-time landowners to realize additional income through a lot sale without increased regulatory burden. It is important to specify that the original lot has frontage on a public road to avoid potential abuse of the ordinance in a manner that could result in significant fragmentation such as un-reviewed division of back lots or flag lots within the interior of an unfragmented block.]*
7. The enlargement of existing agricultural clearings, or the creation of new agricultural clearings including pastures, provided the permanent clearings are utilized for agricultural purposes for a minimum of 30 years prior to any non-agricultural use. If such clearings are used for agriculture for fewer than 30 years, but are maintained as permanent clearings (*conversion to lawn, house lots, etc.*), the area maintained as a permanent clearing within the Overlay District shall be considered a disturbance for the purposes of Section E. If the agricultural use is abandoned during

the 30-year period and the clearing is allowed to naturally regenerate, the cleared area will not be considered a disturbance.

*[**Explanatory Note:** This exemption is suggested as a way to not penalize rural agricultural uses and as a way to not inadvertently discourage new farms from becoming established. The 30-year clause is included as a mechanism to avoid abuse of the exemption. The timeframe suggested is fairly arbitrary, but assumes that if a landowner is willing to keep his or her land in agriculture for the 30 year period, then that person has contributed significantly to local rural character and should not be penalized for development after the 30 year term expires .*

C. Standards for Development Activity

1. Activities in the overlay districts shall minimize disturbances to the extent feasible.
2. Activities in the overlay districts are subject to habitat mitigation, or eligible for bonus densities, based on the provisions in Section E Habitat Disturbance Analysis.
3. The Codes Enforcement Officer or Planning Board may reduce front, side, and rear setback requirements to minimize disturbances within the overlay district provided:

   a. no other reasonable alternative exists, and

   b. the setback reduction(s) will not cause unreasonable adverse impacts to the adjacent property.

*[**Explanatory Note:** This ordinance attempts to get applicants for development projects to: 1) consider alternative project designs that would avoid impacts to the mapped resource; 2) if avoidance is impractical, then design the project to minimize the amount of disturbance (C.3 allows flexibility in design standards to help accomplish impact avoidance and minimization); and 3) if significant disturbance is unavoidable as a result of the project design analysis, then allow the applicant to replace a percentage of the lost habitat functions through "habitat mitigation".]*

D. Approval of Activities

1. Development review classifications (*Major and Minor*) and thresholds are defined under Section _____ of the town land use ordinance.
2. Activities requiring a building permit, but not formal development review, will be reviewed jointly by the Codes Enforcement Officer and Planning Department for compliance with this section of the ordinance.
3. Activities requiring an entrance (*driveway opening*) permit must include a copy of the entrance permit application with the building permit application. Clearing for these activities shall not occur until the driveway location and layout is approved as part of building permit review.
4. On-site project planning meetings with the Town Planner or Codes Officer are encouraged in order to avoid and minimize disturbance of the overlay district.

*[**Explanatory Note:** This ordinance has been written to apply in the review of both large projects that require formal planning board review such as subdivisions, and smaller projects such as single home construction projects that may only need a building permit. An additional provision has been added to capture driveway entrance permits that are often only reviewed by a public works director or road commissioner. Placement of roads, even private gravel drives, can result in significant habitat impacts themselves and ultimately determine the pattern of future development.]*

E. Habitat Disturbance Analysis

In the case of subdivisions, disturbance shall include the area within residential lots other than those portions of the lot encumbered by deed restriction, conservation easement, or similar mechanism that limits future disturbances to those which meet the purposes of this ordinance.

*[**Explanatory Note:** The disturbance analysis, in keeping with the general approach of this ordinance, is designed to offer project design flexibility. The project applicant can design a project using any lot size desired, and will only be asked to base habitat mitigation on those areas directly disturbed, and those portions of the individual lots that could be further cleared in the future should the lot*

owners desire. Order of review is important to successfully meet the objectives of minimizing fragmentation. Section C-1 should be used to guide project design such that it minimizes disturbance first before any discussions of mitigation under Section E are initiated.]

1. **Core Habitat District**
   Habitat mitigation, or density bonus eligibility, within the Core Habitat District shall be provided in accordance with the following table. The amount of the disturbance is the cumulative amount on parcels that exist as of record on the date this section is adopted ("original parcel"). Division of the original parcel after the adoption of this ordinance does not change the measurement of cumulative disturbance on the original parcel.

   The mitigation requirement is determined separately for each percentage category of disturbance. Examples of how to calculate mitigation requirements are attached below under "Explanation of Terms Used".

Percent area of Core Habitat District on original parcel that is disturbed up to:	Area of Original Parcel covered by Overlay: 0 - 50%	Area of Original Parcel covered by Overlay: 51 -75%	Area of Original Parcel covered by Overlay: 76 - 100%
0%	no mitigation	15% density bonus	20% density bonus
15%	no mitigation	no mitigation	15% density bonus
25%	3:1 mitigation	2:1	10% density bonus
50%	3:1 mitigation	2:1 mitigation	2:1 mitigation
100%	3:1 mitigation	2:1 mitigation	2:1 mitigation

*[**Explanatory Note:** If an ordinance is to be successful and receive public support, it needs to be crafted in a manner that it treats a variety of parcel specific situations equitably. The table above is intended to create a sliding scale for review based on the percentage of the applicant's land in the overlay district and the proposed amount of disturbance. It allows landowners whose parcels are completely, or mostly within the overlay district, more flexibility in terms of the amount of disturbance allowed than those landowners whose parcels allow greater avoidance and minimization potential. Threshold percentages that trigger mitigation or allow a density bonus should be carefully considered and adjusted to fit the local situation. Determining the mitigation requirement separately for each percentage category can help to avoid situations where a small increase in disturbance necessitates a doubling of mitigation required (refer to "Explanation of Terms Used" attached below.]*

2. **Supporting Habitat District**
   No subdivision shall disturb more than 50% of the Supporting Habitat District acreage on a given parcel without mitigating at a 1.5:1 ratio for those impacts and placing remaining undeveloped acreage into conservation. Projects that reduce total disturbance to less than 50% of the Supporting Habitat District acreage shall be eligible for a 10% bonus density.

F. Density Bonus: Permanent Habitat Protection Requirement
A density bonus will be granted only if the remaining land in the overlay district on the parcel is permanently protected through a conservation easement, deed restriction, or similar mechanism that limits future disturbance.

G. Habitat Impact Mitigation Requirements
Applicants are encouraged to discuss approaches to meeting this requirement with Codes Enforcement and/or planning staff prior to finalizing formal real estate agreements.

1. Acceptable Mitigation
   a. Core Habitat District
      i. Land for mitigation shall be permanently protected through a conservation easement, deed restriction, or similar mechanism that limits future disturbance. Mitigation land should be within the same sub-watershed as the disturbed area; if the CEO or Planning Board determines that no land is available in the same sub-watershed, then land in another watershed within the Core Habitat District may be used to satisfy this requirement.

*[**Explanatory Note:** By delineating the overlay districts, the municipality is designating priority areas for conservation. The mitigation requirements can be satisfied by protecting the necessary acreage anywhere in the sub-watershed impacted. This provision allows for greater flexibility for the developer and can often result in "interior" or less fragmented and more ecologically significant lands being protected rather than tying the applicant to designating open space within the project parcel.]*

ii. The Town will maintain a list of landowners who are potentially willing sellers of acreage in fee, or development rights, of a portion of their property located within Core Habitat District.

*[**Explanatory Note:** One goal of this ordinance is to create mechanisms that would allow large landowners, who do not want to divide their property, additional options to reduce financial burdens of ownership. This provision is included to cultivate private partnerships for habitat protection.]*

iii. A conservation easement, deed restriction, or similar mechanism that limits future disturbance can be utilized on portions of newly created lots to meet the mitigation requirement.

*[**Explanatory Note:** Some developers prefer selling larger lots in rural areas rather that reducing lot size to reduce disturbance calculations. This provision allows the project applicant to place portions of individual lots under conservation easements thereby avoiding having the entire lot counted as an impact. This provision should be considered carefully. Easements require monitoring and enforcement which can be a burden for the easement holder. This provision may also encourage more fragmented open space being conserved rather than a contiguous chunk that is more valuable as habitat. It is important to first require that an applicant meet the avoidance and minimization standard (C-1) prior to using this section for mitigation purposes.]*

iv. Projects that require mitigation within the Core Habitat District may pay a fee in lieu of land protection equivalent to $5,000 per acre of mitigation acreage required only after the land protection option of A.1.a has been considered and the reviewing authority finds that land is not available.

Payment of a fee can be used in combination with land protection to meet the overall mitigation requirement.

*[**Explanatory Note:** Payment of an in lieu fee can be an important alternative in there rare case that no suitable lands exist for preservation in the designated overlay, or if the project is on a short time frame and cannot secure land for protection without unreasonably delaying project approval. This mechanism would allow the Town to collect monies that would go into a land acquisition fund.*

b. Supporting Habitat Requirement

i. Land for mitigation within the Supporting Habitat District must be permanently protected through a conservation easement or similar mechanism that limits future disturbance. Mitigation land must be within the corridor as the disturbed area.

ii. If the requirements under b.i cannot be met, then the applicant can satisfy mitigation requirements by restoring or enhancing woody vegetation cover in portions of the District that have been previously disturbed by clearing or similar disturbance. Restoration and enhancement proposals must be reviewed and approved by the Codes Enforcement/Planning Office, and the restored and /or enhanced acreage must be placed under permanent protection through a deed restriction, conservation easement or similar mechanism.

DEFINITIONS SPECIFIC TO THIS ORDINANCE

Agricultural Clearing: a clearing created to support the production of traditional agricultural crops including grazing areas for livestock, fields used for the production of hay, straw, and other fruit, grain, and vegetable crops, Christmas tree farms, and orchards, etc. This definition does not include mineral extraction.

Naturally occurring stands dominated by woody vegetation: an area of forest, shrub land, heath barren, or regenerating timber harvest. This definition does not include artificially planted Christmas tree farms or maintained pine plantations.

Disturbance: For the purposes of this overlay district, "disturbance" shall be defined as the area to be filled, graded and/or permanently cleared of naturally occurring stands dominated by woody vegetation for activities included in Section II.A.

Permanent Clearing: For the purposes of the overlay districts, "permanent clearing" shall be defined as the removal of 40% or more of the volume of trees, or the creation of a cleared opening in the forest canopy that is greater than 250 square feet as measured from the outer limits of the tree crown, neither of which is allowed to naturally regenerate.

*[**Explanatory Note:** Disturbance and permanent clearing are the basis for impact analysis and must be clearly defined with little room for misinterpretation. The Permanent Clearing definition draws on standards included in state shoreland zoning guidelines that are familiar to both local planners and codes enforcement officers.]*

HOW TO CALCULATE AMOUNT OF MITIGATION REQUIRED? TWO EXAMPLES

Percent area of Core Habitat District on original parcel that is disturbed up to:	Area of Original Parcel covered by Overlay: 0 - 50%	Area of Original Parcel covered by Overlay: 51 -75%	Area of Original Parcel covered by Overlay: 76 - 100%
0%	no mitigation	15% density bonus	20% density bonus
15%	no mitigation	no mitigation	15% density bonus
25%	3:1 mitigation	2:1	10% density bonus
50%	3:1 mitigation	2:1 mitigation	2:1 mitigation
100%	3:1 mitigation	2:1 mitigation	2:1 mitigation

EXAMPLE A: Assume 20-acre parcel of which 10 acres is covered by overlay district (50%)

If up to 15% proposed impact on 10 acres of the overlay (=1.5 acres), then *no mitigation is required.*

If 25% proposed impact on 10 acres of the overlay (=2.5 acres), then 7.5 acres of mitigation required.

This can be satisfied by permanently protecting the 7.5 acres of remaining unimpacted overlay.

If 50% proposed impact on 10 acres of the overlay (= 5.0 acres), then 15 acres of mitigation is required.

This can be satisfied by permanently protecting the remaining 5.0 acres of unimpacted overlay plus another 10 acres of overlay elsewhere.

If 100% proposed impact on 10 acres of the overlay (= 10.0 acres), then a total of 30 acres of mitigation is required.

This can be satisfied by permanently protecting 30 acres of overlay elsewhere.

EXAMPLE B: Assume 20 acre parcel of which 15 acres is covered by overlay district (75%)

If up to 15% proposed impact on 15 acres of the overlay (= 2.25 acres), then no mitigation is required.

If 25% proposed impact on 15 acres of the overlay (= 3.75 acres), then 7.5 acres of mitigation is required.

This can be satisfied by permanently protecting 7.5 acres of remaining unimpacted overlay.

If 50% proposed impact on 15 acres of the overlay (= 7.5 acres), then 15 acres of mitigation is required.

This can be satisfied by permanently protecting the remaining 7.5 acres of unimpacted overlay and 7.5 acres of overlay elsewhere.

If 100% proposed impact on 15 acres of the overlay (= 15.0 acres), then 30 acres of mitigation is required.

This can be satisfied by permanently protecting 30 acres of overlay elsewhere.

EXPLANATION OF TERMS USED

"Percent Area of Core Habitat District on original parcel that is disturbed up to" = Area of Overlay District within Original Parcel **(parcel that exists as of the date of effectiveness of these amendments)** that is **proposed to be** disturbed up to.

APPENDIX F
MODEL ORDINANCE FOR CONSERVATION SUBDIVISIONS

A. Purpose

This section establishes standards for conservation subdivisions that set aside a significant portion of the site as common open space that is permanently protected while allowing the homes to be clustered on smaller lots on the portions of the site that have the least value for conservation purposes. The standards are intended to ensure that those areas of the site that are not developable and that have significant resource value important to support plant and animal habitat functions within the surrounding area are included in the common open space.

These provisions are designed to ensure that conservation subdivisions developed in the Town:

1. Preserve those areas of the site that have the highest natural resource value for conservation purposes (*refer to 5 priorities listed below*);
2. Locate the buildings and structures on those portions of the site that are most appropriate for development while minimizing fragmentation of important aquatic and terrestrial habitats,
3. Result in contiguous open spaces or "greenways" by linking the designated open spaces in adjoining subdivisions wherever possible; and,
4. Minimize the impact of rural residential development on the Town, neighboring properties, and the natural environment.

This innovative type of development permits homes to be built on lots that are smaller than normally allowed, but requires undeveloped land to be preserved. The overall density of a conservation subdivision is no greater than a traditional development. In a conservation subdivision streets and utility lines are usually shorter, thus allowing development at a lower construction cost initially and lower maintenance costs in the future.

*[**Explanatory Note:** The municipality may wish to include a density bonus for conservation subdivisions if they are voluntary.]*

B. Applicability

Subdivisions may be designed as conservation subdivisions in the _____ Districts, in accordance with these provisions. In the Rural Residential and Critical Rural Districts, all subdivision projects shall be designed as conservation subdivisions in accordance with these provisions.

C. Maximum Density

The maximum number of dwelling units that may be developed in a Conservation Subdivision shall be determined by dividing the calculated Net Residential Area of the parcel by the required Minimum Net Residential Area per Dwelling Unit for the district in which the subdivision is located and rounding down to the maximum allowed whole number of units. If the subdivision involves only part of a parcel, the Net Residential Area shall be calculated for that portion of the parcel proposed to be included in the subdivision and the determination of the maximum number of dwelling units within the subdivision determined based upon that Net Residential Area.

The net residential acreage is calculated by taking the total area of the lot and subtracting, in order, the following:

1. Fifteen percent of the area of the parcel to account for roads and parking.

2. Portions of the lot which, because of existing land uses or lack of access, are isolated and undevelopable for building purposes or for use in common with the remainder of the lot, as determined by the Planning Board.
3. Portions of the lot shown to be in the floodway as designated in the Flood Boundary and Floodway Map prepared by the Federal Emergency Management Agency.
4. Portions of the lot which are unsuitable for development in their natural state due to ecological, topographical, drainage, or subsoil conditions such as, but not limited to:
   a. Slopes greater than 20%.
   b. Wetlands as defined by Maine's Natural Resource Protection Act MRS Title 38 Chapter 480
   c. Areas within 75-feet of a stream as defined by Maine's Natural Resource Protection Act MRS Title 38 Chapter 480 B
   d. Areas containing habitat, whether or not mapped, for species appearing on the official State or Federal lists of endangered or threatened plant and animal species where there has been evidence of the occurrence of the species
   e. Areas containing any of the following Significant Wildlife Habitats, as defined by the Department of Inland Fisheries and Wildlife: a) high and moderate value deer wintering areas and travel corridors; b) high and moderate value waterfowl and wading bird habitat, including nesting and feeding areas; c) shorebird nesting,feeding and staging areas and seabird nesting islands, or d) areas within 250-feet of a significant vernal pools;
5. Portions of the parcel subject to a right-of-way.
6. Portions of the parcel located in the Resource Protection District.
7. Portions of the parcel below the high water line of any surface water.
8. Portions of the parcel utilized for stormwater management facilities.

D. Basic requirements for conservation subdivisions.

1. Conservation subdivisions must meet all requirements for a traditional subdivision, the street acceptance requirements, and all other applicable Town ordinances.
2. Each building must be an element of an overall plan for site development. The developer must specify the placement of buildings and the treatment of spaces, paths, roads, utility service, and parking, and in so doing must take into consideration all requirements of this section and of other relevant sections of _____.
3. A high-intensity soil survey must be submitted. No building may be constructed on soil classified as being very poorly drained.
4. Except for in-ground homes, no building may be located or constructed on slopes steeper than 15%.
5. No building may be located or constructed within 100 feet of any stream, water body or freshwater wetland of special significance as defined as having one or more of the following characteristics:
   a. *Critically imperiled, imperiled community, or exemplary natural community.* The freshwater wetland contains a natural community that is critically imperiled (S1), imperiled (S2), or identified as an exemplary natural community as defined by the Maine's Natural Areas Program.
   b. *Significant wildlife habitat.* The freshwater wetland contains significant wildlife habitat as defined by 38 MRSA §§ 480-B(10).
   c. *Location near coastal wetland.* The freshwater wetland area is located within 250 feet of a coastal wetland.
   d. *Location near [a] GPA3 great pond.* The freshwater wetland is located within 250 feet of the normal high water line, and within the same watershed, of any lake or pond classified as GPA under 38 §§ MRSA 465-A.

e. *Aquatic vegetation, emergent marsh vegetation, or open water.* The freshwater wetland contains, under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation, or open water, unless the 20,000 or more square foot area is the result of an artificial pond or impoundment.

f. *Wetlands subject to flooding.* The freshwater wetland area is inundated with floodwater during a 100-year flood event based on flood insurance maps produced by the Federal Emergency Management Agency (FEMA) or other site-specific information.

g. *Peatlands.* The freshwater wetland is or contains peatlands, except that the department may determine that a previously mined peatland, or portion thereof, is not a wetland of special significance.

h. *River, stream, or brook.* The freshwater wetland area is located within 25 feet of a river,stream, or brook."

6. No lot (or area of occupation, in the case of a condominium project) may be smaller in area than 20,000 square feet.

7. Required Common Open Space – Common open space meeting the following requirements shall be created and permanently protected as part of any Conservation Subdivision:

   a. Minimum Amount Required – The amount of common open space provided within the subdivision shall be equal to or greater than the sum of the following:

      i. fifty percent (50%) of the calculated Net Residential Area; plus,

      ii. the unsuitable area of the parcel that is deducted from the gross area of the site to determine the Net Residential Area.

   b. Priorities for Land Included in Open Space – The land set aside in the common open space shall be selected based upon the following priorities:

      Priority #1
      Primary Conservation Areas including streams, wetlands, floodplains, vernal pools, and areas with a slope in excess of 25%. Any setbacks or vegetative buffers that are required by ordinance along these protected resources shall also be considered Primary Conservation Areas.

      Priority #2
      Secondary Conservation Areas that provide protection for unique or irreplaceable resources including the habitat of rare, threatened, or endangered plant and animal species, upland areas within 250 feet of vernal pools, and rare or exemplary natural communities.

      Priority #3
      Secondary Conservation Areas including mapped significant wildlife habitat and undeveloped areas within 250-feet of mapped habitat.

      Priority #4
      Secondary Conservation Areas that contribute to habitat connectivity such as riparian lands adjacent to tidal wetlands, river or stream corridors, wildlife travel corridors, trails, and unfragmented habitat blocks. The width of such corridors shall be as follows:

         a. Tidal wetlands or rivers: 250-feet inland from the high water line

         b. Streams, including first order streams: 100-feet from high water line

         c. Wildlife travel corridors – 300 feet in width and that maintain, or contribute to, naturally vegetated linkage between unfragmented habitat blocks or other conserved land

         d. Recreational Trail Corridors – 25 feet on either side of the trail

         e. For the purposes of open space prioritization, unfragmented habitat blocks shall have a minimum contiguous area of 150 acres.

Priority #5

Secondary Conservation Areas that are adjacent to other protected open space. Whenever possible, open spaces shall be designated to abut existing conservation land to help achieve a cumulative protected acreage of 150 acres or greater.

8. All subdivisions shall be designed in accordance with the following four-step process. The submission for the preliminary plan of a major subdivision or the final plan of a minor subdivision (if required by the Planning Board) shall include documentation of the four-step design process for determining the layout of the subdivision including proposed conservation lands, house sites, streets, and lot lines in accordance with the following process. Applicants shall submit four separate sketch maps indicating the findings of each step of the design process, if so requested by the Planning Board.

STEP ONE: DELINEATION AND DESIGN OF COMMON OPEN SPACE

Step 1A. Delineation of Common Open Space

The area to be designated as common open space or otherwise preserved as part of the development shall be delineated based upon the Primary and Secondary Conservation Areas. The proposed common open space in conservation subdivisions shall be identified in accordance with the following:

1. The minimum percentage and acreage of required common open space shall be calculated by the applicant and submitted in accordance with the provisions of this ordinance and of the Zoning Ordinance.
2. The proposed common open space shall be designated using the Site Analysis Sketch Plan as a base.
3. The Primary Conservation Areas on the site shall be delineated and shall be incorporated into the common open space. The Primary Conservation Areas shall include floodplains, wetlands, and areas with sustained slopes over 25 percent.
4. The Secondary Conservation Areas on the site shall then be delineated. In delineating Secondary Conservation Areas, the applicant shall prioritize natural resources on the tract in terms of their highest to lowest suitability for inclusion in the proposed common open space based upon the 5 Priorities for Land Included in Open Space
5. On the basis of those priorities and practical considerations related to the tract's configuration, its context in relation to resource areas on adjoining and neighboring properties, and the applicant's subdivision objectives, sufficient Secondary Conservation Areas shall be identified to be included in the common open space to meet at least the minimum area percentage requirement for common open space. This delineation shall clearly indicate the boundaries as well as the types of resources included within them.
6. The proposed common open space shall include all Primary Conservation Areas and the Secondary Conservation Areas with the highest resource significance as identified in 5.

Step 1B. Design of Common Open Space

1. All open space areas shall be part of a larger continuous and integrated open space system within the parcel being developed. At least 75 percent of the common open space shall be contiguous to another common open space area. For the purposes of this subsection, areas shall be considered contiguous if they are within 100 feet of each other and there are no impediments to access between the areas.
2. No area of common open space shall be less than 50 feet in its smallest dimension and less than 10,000 square feet in area. Open space not meeting this standard is allowed as an added project enhancement, but shall not be counted toward the required project common open space.
3. The boundaries of common open spaces shall be marked by natural features wherever possible, such as hedgerows, stone walls, edges of woodlands, streams, or individual large trees. Where no such existing demarcations are present, additional plantings, fences that do not block animal movement, or other landscape features shall be added to enable residents or the public, if applicable, to distinguish where the common open

space ends and private lot areas begin. Where structural demarcations, such as fences are used, they shall be the minimum needed to accomplish this objective.

STEP TWO: LOCATION OF BUILDING SITES

Potential building sites shall be tentatively located taking into consideration the proposed common open space and/or the Primary and Secondary Conservation Areas identified in Step 1 as well as other relevant data such as topography and soils. Building sites shall not be located within primary or secondary conservation areas and shall be located at least 100 feet from streams and freshwater wetlands of special significance.

STEP THREE: DETERMINE ROAD LAYOUT AND STREAM CROSSING INFRASTRUCTURE

Based upon the designated building sites, a circulation plan shall be designed to provide vehicular and pedestrian access to each site. The street layout shall bear a logical relationship to topographic conditions. Impacts of the street plan on proposed conservation lands shall be minimized, particularly with respect to crossing environmentally sensitive areas such as wetlands and minimizing cut and fill. Street connections shall generally be encouraged to minimize the number of new cul-de-sacs and to facilitate access to and from buildings in different parts of the subdivision. Shared driveways shall be encouraged to minimize crossings of environmentally sensitive areas. Where crossings are unavoidable, bridges, oversized culverts, or similar structures shall be utilized to maintain passage opportunities for fish, amphibians, reptiles, and small mammals. Crossing structures that maintain a natural stream bottom are preferred. For culvert crossings, the span or diameter of stream crossing structures must be at least 1.2 times the bankfull width of the stream and shall be embedded > 1 foot for box culverts and pipe arches, and at least 25 % for pipe culverts. Substrate within the culvert must match the composition of the substrate in the natural stream channel at the time of construction. Culverts must be designed to provide water depths and velocities at low flow that are comparable to those found in upstream and downstream natural stream segments. Openness ratio (the cross-sectional area of a structure divided by its crossing length when measured in meters) should be > 0.25. For a box culvert, openness = (height x width)/length.

STEP FOUR: DRAWING IN THE LOT LINES

Upon completion of the preceding three steps, lot lines shall be drawn as required to delineate the boundaries of individual lots. Lots shall be designed in keeping with the standards for individual lots found in Section _____ of the Zoning and Site Plan Review Ordinance and shall be further designed to provide each residence with a clear delineation of its property bounds and with useable yard spaces.

9. The Codes Enforcement Officer or Planning Board may reduce front, side, and rear setback requirements to minimize disturbances to primary and secondary conservation areas provided that:

   a. no other reasonable alternative exists, and

   b. the setback reduction(s) will not cause unreasonable adverse impacts to the adjacent property.

10. Shore frontage may not be reduced below the minimum normally required in the Shoreland District.

11. Where a conservation subdivision abuts a body of water, a usable portion of the shoreline, as well as access to it, must be a part of the undeveloped land.

12. Buildings must be oriented with respect to scenic vistas, natural landscape features, topography, solar energy, and natural drainage areas, in accordance with an overall plan for site development.

13. The applicant must demonstrate the availability of water adequate for domestic purposes as well as for fire safety. The Planning Board may require the construction of storage ponds and dry hydrants. The location of all wells must be shown on the plan.

14. The location of subsurface wastewater disposal systems and an equivalent reserve area for replacement systems must be shown on the plan. The reserve areas must be restricted so as not to be built upon. The report of a licensed site evaluator must accompany the plan. If the subsurface disposal system is an engineered system, approval from the

Department of Human Services, Division of Health Engineering, must be obtained prior to Planning Board approval.

15. Utilities must be installed underground wherever possible. Transformer boxes, pumping stations, and meters must be located so as not to be unsightly or hazardous to the public.

E. Dedication and maintenance of the undeveloped land and any common facilities.

1. The undeveloped land is that area which is not included in the residential lots. There may be no further subdivision of the undeveloped land. This undeveloped land may be used only for agriculture, forestry, and/or conservation under a stewardship plan that supports the wildlife conservation attributes of the property. However, easements for public utilities, or structures accessory to agriculture or conservation, may be approved by the Planning Board.
2. The undeveloped land must be shown on the development plan and with appropriate notation on the face thereof to indicate:

   (a) That the undeveloped land may not be used for future building lots; and

   (b) The final disposition of the undeveloped land, which may be:

   1. Dedicated to the Town for acceptance;
   2. Dedicated to a land trust;
   3. Dedication of development rights of open space to a suitable land trust (via a conservation easement) with ownership by a private individual or homeowners association;
   4. Ownership by a private individual with an open space protection deed enforceable by any land owner within the subdivision, any owner of separate land parcels abutting the open space, or the municipality; or
   5. Reserved for ownership by a homeowners' association made up of the owners of the lots in the conservation subdivision and which assumes full responsibility for its maintenance with open space protection deed restrictions enforceable by any landowner in the subdivision, any owner of separate land parcels abutting the open space, or the municipality.

3. If the undeveloped land is dedicated to the Town as in Subsection **E(2)(b)[1]**above, the Planning Board, in consultation with the Conservation Commission *(OPTIONAL)*, must approve the language of the dedication and the uses allowed in the undeveloped land.
4. If the undeveloped land is dedicated to a land trust as in Subsection **E(2)(b)[2]** or **E(2)(b)[3]** above, the Planning Board must approve the land trust and the conditions of the dedication or conservation easement.
5. If any or all of the undeveloped land is to be reserved for use by the residents as in Subsection **E(2)(b)[5]** above:

   1. A homeowners' association must be formed and the bylaws of the homeowners' association must specify maintenance responsibilities. The bylaws must be submitted to the Planning Board for its approval prior to approval of the development plan.
   2. Covenants for mandatory membership in the association, setting forth the owners' rights and interest and privileges in the association and the undeveloped land, must be reviewed by the Planning Board and included in the deed for each lot.
   3. The homeowners' association has the responsibility of maintaining the undeveloped land and any common facilities until accepted by the Town.
   4. The association must levy annual charges against all property owners to defray the expenses connected with the maintenance of the undeveloped land, other common and recreational facilities, and Town assessments.
   5. The developer must maintain control of the undeveloped land and be responsible for its maintenance until development sufficient to support the association has taken place. Such determination is made by the Planning Board upon request of the homeowners' association or the developer.